



U.S. Geological Survey

Strategic Plan
1997 to 2005

September 30, 1997

September 30, 1997

TABLE OF CONTENTS

Vision/Mission Statement	1
Preface	2
The USGS in the Year 2005 Highlights	4
Introduction	6
Part 1: Driving Forces: Political, Economic, Societal, and Global	8
Part 2: Core Competencies	14
Part 3: Business Activities: Goals and Performance Measures	19
1: Water Availability and Quality	20
2: Natural Hazards	24
3: Geographic and Cartographic Information	28
4: Contaminated Environments	31
5: Land and Water Use	34
6: Nonrenewable Resources	37
7: Environmental Effects on Human Health	39
8: Biological Resources	41
Part 4: Description of How General Goals and Objectives Are Achieved	46
A: Program Management	46
B: Organization	47

C: Major Installations	47
D: Governmentwide Leadership	47
E: Customers and Partners	49
F: Technology Transfer	52
G: Information Management	52
H: Human Resources	53
Part 5: Program Evaluations (and other documents) that are used in Establishing Goals, and Schedule of Future Evaluations	55
Part 6: Next Steps	59
Appendices	60
Appendix 1: The USGS Governmentwide role in National Mapping, Geography, and Surveys	61
Appendix 2: The USGS Governmentwide role in Geologic Mapping	65
Appendix 3: The USGS Governmentwide role in Water Resources Investigations	68
Appendix 4: The USGS Governmentwide role in the Biological Resources Investigations	70
Appendix 5: USGS Customers and Partners	73
Glossary	85

Government Performance and Results Act

Quick Reference

U.S. Geological Survey - Strategic Plan

Statute Reference	Required Component	Location
306(a)(1)	comprehensive mission statement	See page 1.
306(a)(2)	general goals and objectives	See pages 19-45.
306(a)(3)	Description of how the goals and objectives are to be achieved	See pages 46-54.
306(a)(4)	Description of how performance goals included in the (annual performance plan) shall be related to the general goals and objectives	See page 59.
306(a)(5)	Key external factors	See pages 8-13.
306(a)(6)	Program evaluations	See pages 55-58

Vision

The U.S. Geological Survey is an earth science organization that is recognized worldwide as scientifically credible, objective, and demonstrably relevant to society's needs.

Mission

The U.S. Geological Survey provides the Nation with reliable, impartial information to describe and understand the Earth.

This information is used to:

- * minimize loss of life and property from natural disasters;
- * manage water, biological, energy, and mineral resources;
- * enhance and protect the quality of life; and
- * contribute to wise economic and physical development.

Preface

In a time
of drastic change,
it is the learners
who inherit the future.

-Eric Hoffer

During the past two decades profound changes have swept across the scientific, social, and political landscape in which the U.S. Geological Survey (the USGS) functions and to which it is inextricably linked. We must actively prepare for the future.

The challenge for the USGS is to stay focused on a horizon of some ten years out, while realizing that there will be near-term shifts that will demand our scrutiny and perhaps mid-course corrections. These shifts and corrections will be driven by such forces as the increasing devolution of Federal government functions to the States and other entities, changes in national demographics, the expanding influence of advances in scientific methods and technologies, and the continuing-- and underlying--tension between the development of the Nation's natural resources and environmental conservation. Beyond these already compelling factors are the public's perception of its investment in science as a means of solving societal problems and society's concept of the "public good" of science.

Our contributions to public policy issues focus on four major themes: the environment, resources, geologic and hydrologic hazards, and integrated data and information management. The Nation's highest priority earth science problems must be approached increasingly from an interdisciplinary perspective that capitalizes on the array of USGS scientific and technical strengths. The consolidation of the National Biological Service with the USGS is a unique opportunity in the scientific community to integrate the physical and biological sciences, to provide the American people with an even richer scientific program about the Earth. Our strengths include a multidisciplinary workforce capable of working anywhere in the Nation, the maintenance of long-term national data bases, and the capability to conduct long-term, broad-scale, multidisciplinary interpretive studies. Our strength also depends on a reputation for objectivity and scientific excellence, as well as a strong heritage of collegial relationships and partnerships with the customers we serve. It is upon these strengths that we will build our future.

This revision of the Strategic Plan for the U.S. Geological Survey, 1996 to 2005 demonstrates that strategic planning is a continuous process that forces an organization to look outward and inward and respond to continuously evolving requirements. It is a process that provides a way to be constantly aware of the choices we have available to us to ensure the health and relevance of

the USGS. It requires a constant dialogue with stakeholders, partners and cooperators--to be sure we select the best course at any point in time.

This strategic plan is a road map drawn to reveal the many routes and options we have to advance with continuous self-renewal, growth, and integrity into the 21st century. This plan will be a living document that will change over time. It is a start toward meeting the challenges posed by "a time of drastic change." We believe that we must balance our internal aspirations with external conditions, address those sometimes opposing or conflicting forces, and move forward into the future.

Gordon P. Eaton
Director, U.S. Geological Survey

The USGS in the Year 2005 Highlights

What will characterize the U.S. Geological Survey in 2005? The USGS will be focused on a well-defined group of business activities. The level of effort applied to current activities will be different. For example, the USGS will conduct more studies on hazards, water, and contaminated environments and fewer studies on nonrenewable resources. The following are the salient changes in emphasis:

Increasing Emphasis

- * long-term interdisciplinary studies
- * mitigation studies
- * quality and accessibility of resources
- * international mineral/energy studies
- * nontraditional disciplines
- * regional and national studies
- * geospatial data integration
- * applied research and development
- * technology transfer
- * issue-driven studies
- * studies involving population centers
- * multiple-risk assessments
- * digital products
- * real-time event responses

Decreasing Emphasis

- * single-discipline studies
- * remediation studies
- * distribution and quantity of resources
- * domestic mineral and energy studies
- * traditional earth science disciplines
- * local studies
- * sole production of geospatial data
- * basic research studies
- * compartmentalized technology
- * investigator-driven studies
- * wilderness areas studies
- * single-risk assessments
- * paper products
- * post-event responses

The USGS of 2005 will reach across organizational boundaries to take greater advantage of the most useful skills, data, and technology and apply them to a more integrated, multidisciplinary approach to scientific problem solving.

The USGS will seek more cost-effective methods of building and supporting services such as administration, personnel development, publications, and telecommunications. The USGS will take an organization-wide approach to acquiring and maintaining advanced technological capabilities. The agency's work-force will continue to be distributed nationally, but local offices will be able to engage a greater range of disciplinary skills in their program development. Additionally, the USGS will draw on skills outside of the traditional earth sciences to respond to society's changing needs.

The USGS of 2005 will rely much more on partnerships as a routine means of doing business. The USGS will develop more extensive partnerships with other Federal agencies, academia, State and local governments, nongovernmental organizations, and private industry. These partnerships will supplement USGS skills and resources needed to accomplish its work. Together, the USGS and its partners will leverage the combined resources in many business

activities: collect and distribute data of the highest possible quality; populate USGS national data bases with increasingly large quantities of reliable and timely data; reach out to communities, the media, schools, and new users of USGS information; and produce a broad range of earth science information products.

The USGS of 2005 will benefit from increased national name recognition. The positive image of the USGS will result from a combination of the high quality and timeliness of USGS products and the relevance of these products to problems with which the public is concerned. Extensive and continuing outreach will help the public understand how earth science affects the economy and the quality of life; will promote valuable, relevant USGS products; and will expand opportunities for the USGS to contribute scientific understanding and data to important public issues.

Introduction

The Strategic Plan for the U.S. Geological Survey that was published on June 6, 1996, was designed and developed to provide a statement of direction for the U.S. Geological Survey (the USGS) as an organization. The plan did not focus on any particular organizational unit within the USGS. The plan reflects the Vision of the USGS in 2005 and the refined statement of the Mission of the USGS, found on the second page of this document. An important aspect of the plan is that it highlighted the shifts in organizational emphasis that are expected to occur between now and 2005. The Strategic Plan for the U.S. Geological Survey was developed between November 1994 and February 1996 by the Strategic Planning Team, whose membership represented all of the major organizational and geographic units of the USGS. This team worked closely with the USGS Policy Council and program managers throughout the USGS. The strategic planning process included evaluating the current organization and its activities, considering which future external events might unfold and how such events would affect the USGS, and developing the strategic actions presented herein.

In performing its work, the Strategic Planning Team prepared five documents in addition to the Strategic Plan, to provide information to support the conclusions and strategic actions contained in the plan. These are Workplan, Strengths and Weaknesses of the U.S. Geological Survey, Profiles of USGS Programs, Managing Opportunities and Threats Affecting the U.S. Geological Survey, and Scenarios for the Future of the U.S. Geological Survey. Workplan describes the process used in developing the Strategic Plan. Strengths and Weaknesses of the U.S. Geological Survey analyzes strengths and weaknesses and, together with Profiles of USGS Programs, describes the USGS as of June 1995. Managing Opportunities and Threats Affecting the U.S. Geological Survey and Scenarios for the Future of the U.S. Geological Survey are important tools in describing driving forces and possible future states for the USGS. Scenarios contains neither predictions of the future nor strategies, but concepts of possible future worlds derived partly from the driving forces influencing today's society. The team developed strategic actions that anticipated or responded to the implications of these scenarios.

The USGS views the Strategic Plan for the U.S. Geological Survey as an umbrella under which all organizational units of the USGS will create their own strategic plans. The National Biological Service (NBS) Strategic Science Plan, which was under development at the time of the merger of NBS with the USGS, will guide the initial scientific efforts of the Biological Resources Division of the USGS. The National Mapping Division Strategic Plan was developed with the USGS Strategic Plan as a guide and was completed in December 1996. All organizational units will participate in the implementation of the strategic actions outlined in this plan.

Much of what was published in the June 6, 1996, document is part of this document with supplementary information required to be included in strategic plans by the Government Performance and Results Act of 1993.

Organization of the Text

The text of the plan is divided into six major parts. Part 1 discusses the key external driving forces that are likely to influence the options and choices for the future direction of the USGS. Part 2 discusses the "core competencies" of the USGS--those attributes that give the USGS its competitive edge. The USGS must excel in all of these competencies in order to succeed by the year 2005. Part 3 describes the "business activities," goals, objectives, and performance measures of the USGS--those scientific and technical efforts currently undertaken by the USGS and those the organization will carry out in the future. These business activities are not defined along traditional program lines. Rather, they represent the key topical areas where one or more USGS organizational units may have interests, as well as the capabilities and skills necessary to pursue the activity. Part 4 provides a description of how the USGS achieves the general goals and objectives outlined in Part 3. This section includes discussion of USGS activities in customer service and technology transfer. Part 5 lists the program reviews and policy statements that continue to influence the formulation and execution of USGS programs. The final section summarizes next steps in the strategic planning process. Several appendices and a glossary of selected terms and concepts contained in the plan are included at the end of the text.

----- ***PART 1*** -----

Driving Forces: Political, Economic, Societal, and Global

Powerful forces in the world are driving a dynamic, uncertain environment in which society as a whole is evolving. These forces--which both significantly influence and create alternatives for the USGS--will shape the future of the United States, the needs of the public, and the roles of Federal agencies. Of particular importance to the USGS are the following forces:

Devolution of Federal government functions: What will be the appropriate role for a Federal earth science agency if many formerly Federal functions are assumed by State or local governments or by the private sector?

New technologies: How will new scientific and information technologies be exploited to help solve problems that concern and affect the public?

Demographic changes: How will a growing population's demand for resources be met? To what extent can the economic impact of natural disasters be mitigated when such disasters affect large population centers?

Public investment in science: What does society expect from investments in research and technology?

Society's concept of "public good": How can earth science that is publicly funded demonstrate its value to society?

Economic versus environmental interests: How might society benefit from impartial and credible earth science information when dynamic tensions between environment and economy arise?

Global interdependence: How can an understanding of global earth science issues contribute to U.S. foreign policy, national and economic security, and environmental quality?

Scarcity and management of natural resources: What can earth science contribute to the development of sound national public policy for natural resources?

These driving forces affect the quality of life of all citizens of the United States. Opportunities to help improve the quality of life through relevant work and research depend on how these forces evolve and how the USGS responds to them.

Devolution of Federal Government Functions

The role of the Federal government is changing and will continue to change. State and local governments, nongovernmental organizations, and private enterprises are beginning to be asked to provide more services, while the Federal government is being asked to provide fewer. The Federal government, including the USGS, needs to find ways to enhance its ability to work through and with other organizations.

The devolution of traditional Federal governmental functions implies significant changes for agencies such as the USGS. The trend toward downsizing, grounded in concerns about balancing the Federal budget, could result in smaller appropriations for the USGS. Responses to this changing environment include seeking novel partnerships with other U.S. and international agencies to take advantage of USGS scientific expertise for the benefit of society.

The USGS response to this challenge is discussed in a variety of ways throughout this document, but is most thoroughly covered in Part 2 of this plan in Core Competency 2, Relationships and Partnerships and in Part 4, subsection E2, Performance through Partnerships, and F, Technology Transfer.

New Technologies

Scientific concepts, analytical techniques, resource extraction technologies, Earth-observing satellites, biotechnology, and information sciences are evolving rapidly. Demand for information in the global economy is satisfied by increasingly cost-efficient and responsive new technologies that allow information to flow freely and quickly across political, economic, and intellectual borders. New technology first offers improved means of doing traditional tasks, but it soon enables people to create products that were never before possible. For example, satellites first helped improve weather forecasts. Today, data transmissions from low Earth-orbit satellites and cellular networks enable "nowcasting"--the immediate communication of events to emergency management agencies, farmers, pilots, and the public at large. The Internet, the World Wide Web (WWW), and cellular technologies have begun to revolutionize the way that consumers acquire information and the methods by which entrepreneurs disseminate information. Unit costs for both technology and information are decreasing.

Information technology also raises customer expectations. Consumers expect technology to be both fast and cheap, and they expect information to be reliable, accessible, and ubiquitous. Furthermore, consumers expect products to include information that is immediately accessible, inexpensive, and easy to use. Providers of information who do not live up to these expectations will find that competitors with better skills and a better customer orientation will fill the gap quickly. The use of scientific data will increase dramatically because real-time, high-capacity data systems are becoming more commonplace. This phenomenon will drive a new generation of

scientific applications and methods to integrate and interpret large quantities of data. In the earth sciences, new technologies and real-time information will be used to nowcast earthquakes, volcanic eruptions, and floods, and to mitigate the impact of such natural disasters on society.

While the USGS draws upon a variety of technologies in the conduct of its programs, information technology is the most pervasive and is discussed throughout the goals and performance measures that appear in Part 3 of this plan. A discussion of the USGS response to passage of the Information Technology Management Reform (Clinger-Cohen) Act and other mandates is included in Part 4, Section G, Information Management.

Demographic Changes

More people are moving to some urban areas, coastal zones, and the Sunbelt States. As population and economic infrastructure become more concentrated, any natural disaster that strikes a population center will have a magnified, perhaps national or global, impact on human life and the economy. The international ramifications of seemingly local natural disasters can be large. Natural disasters can be expensive, especially when a population center is affected. In the United States alone, the annual economic cost of damage caused by natural disasters is estimated to exceed \$50 billion. Although the number of natural disasters is not statistically larger than in the past, the impact of natural disasters on society and the economy continues to increase. Information about natural disasters cannot by itself reduce the intensity of the events, but earth science information can help reduce the deleterious impact of natural disasters on population centers through better scientific understanding, better public education, improved zoning laws, and improved building-design and materials science.

Changes in demographics also affect the competition for and use of resources. For example, as population density increases, there will be new stresses on water resources; different patterns of energy, mineral, and land and water use; and possibly unexpected demands on the infrastructure that supports human health and the quality of life. A scientific understanding of the quality and quantity of natural resources will be key to successful planning for demographic changes.

USGS objectives addressing demographic change issues are discussed under the Business Activities in Part 3 of this plan.

Public Investment in Science

Since World War II, science has been recognized by society as a powerful tool to improve economic and material well-being. For example, as a result of the Nation's investment in science, the United States economy is increasingly based on knowledge-intensive technology. Science, however, has not solved some persistent problems; for instance, science has not been able

to find a cure for cancer nor has it provided a long-term solution to the disposal of nuclear wastes. Even when science has not solved a problem, scientific information can be used to direct public policy making toward solutions grounded in an objective understanding of natural processes.

A balance exists between short- and long-term expectations from science. Science has responded quickly to certain needs, such as faster telecommunications for the Internet or better techniques for modeling the flow of ground water. Other important needs of society might require a broader integration of scientific disciplines, or a deeper understanding of basic principles, in order to provide necessary insight into the underlying processes. Such longer-term investments, perhaps yielding new techniques for detecting signals of impending earthquakes or detecting subtle but significant changes in the environment, can result in enormous long-term returns on investment. However, unless society becomes convinced that solutions will result from long-term investments, federally-funded science will be driven to respond to the short-term service needs of society at the expense of long-term improvements and solutions.

This issue is addressed in Part 2 of this plan under Core Competency 1, Impartiality, Credibility, and Scientific Excellence.

Society's Concept of " Public Good "

What should the public pay for? And what products and services should they expect in return? Different segments of society have different priorities at different times. Public expectations for government services will reflect generational and regional tradeoffs. Devolution of functions of the Federal government implies that the perception of who should provide various public goods is changing. Certain functions continue to be seen as public goods because they benefit the public at large and will not be financed and produced at efficient levels by the private sector. However, private industry is increasingly viewed as a viable alternative source for some products and services that were, and continue to be, funded by government. National public science agencies, such as the USGS, can expect continuing debate about whether the science information that it develops is a public good and whether it needs to be produced at the Federal, versus some other, level of government.

In recent years, there has been a shift toward individual responsibility, and away from the expectation that government will defray risks. Today, individuals in one part of the country may not be willing to pay for services that address problems elsewhere. States and individuals might be expected to cover their own risks, from natural disasters to medical emergencies. Some resources will continue to be shared at the Federal level, but nationwide there are discussions at every level of government about who should have access, and at what cost. National programs could take on a different character, perhaps focused more on coordinating efforts across the United States than on providing services and products directly.

This strategic plan is formulated on the assumption that society will continue to recognize the information generated by the Survey's programs as a public good. Discussion of the issue appears throughout the plan, particularly in Part 2, Core Competency 4, Long Term National Data Bases.

Economic versus Environmental Interests

A popular belief has been that a dynamic tension necessarily exists between the forces promoting development as the basis of economic growth and the forces promoting conservation of the environment. This tension has occurred in the United States and has also existed to varying degrees in other parts of the world. Conflicts manifested by such tension often evolved quickly from being local in scope to being national or global in scope --Chernobyl, the ozone hole, loss of rain forests, greenhouse gases and global change, toxic materials in the Great Lakes, nuclear-waste disposal. In the global economy, there is increased attention to cost competitiveness; environmental legislation, therefore, requires long-term planning to anticipate problems and to seek solutions wherein both goals can be realized in a compatible manner. The planning must be based on credible science to provide unbiased data and information that can be the foundation for common understanding and eventual agreement.

A larger, more concentrated population stresses the natural environment in new ways. A greater scientific understanding, together with cost-benefit analyses of the alternatives available to society, can lead to strategies that balance society's need for economic growth with its need to protect the environment. Decisionmakers should be able to rely on credible, timely earth science information.

USGS' role in providing information for policymakers to resolve these issues is provided in several of the Business Activities in Part 3 of this plan.

Global Interdependence

Natural earth processes and many human activities have effects that transcend political boundaries. For example, questions of human impact on climate change must be addressed in terms of global environmental and economic issues. Additionally, the United States may be potentially affected by earth-related natural processes that occur beyond its borders, such as earthquakes and eruptions of volcanic ash. A natural disaster in a large commercial center such as Tokyo or Hong Kong could have pronounced effects on the U.S. domestic economy.

The global economy has become increasingly interdependent in recent years. Reduced barriers to international trade, as manifested by trade agreements such as the North American Free Trade Agreement, have allowed market forces of supply and demand to regulate the flow of

commodities. Furthermore, self-sufficiency in energy and mineral resources is no longer possible, necessitating a global resource mix.

USGS' role in providing information for policymakers to resolve these issues is provided in several of the Business Activities in Part 3 of this plan.

Scarcity and Management of Natural Resources

Scarce natural resources get attention. Historically, the scarcity of certain resources has caused wars and disrupted national economies. Today, most resources are available, for a price, somewhere in the global economy. Oil and gas are relatively abundant and accessible, even if geographically distant. Minerals are also available from a variety of sources. Global economics dictates the availability and the price of these resources to the U.S. economy.

However, economics alone does not drive decisionmaking about all domestic resources. The management of finite land, water, and living resources can, and have, become subject to considerable debate because of the conflicting demands that are made, particularly as demographic shifts result in changing distributions of population. Earth science information about the characteristics of land and water can help define the opportunity costs and the economic consequences of alternative policies for the wise management of these resources.

USGS' role in providing information for policymakers to resolve these issues is provided in several of the Business Activities in Part 3 of this plan, particularly in Business Activity 5, Land and Water Use.

-- ***PART 2*** --

Core Competencies

Core competencies are the key skills, characteristics, and assets that the USGS must develop and maintain, in order to excel in current and future business activities. These competencies are the essential qualities that, when used to achieve the vision and mission of the USGS and to conduct the business of the USGS, differentiate the capabilities of the USGS from those of other organizations. The development of core competencies requires an investment in time, skill, and resources. Competencies evolve over time and are enhanced with use. An organization cannot easily speed up the process of creating core competencies, and they can deteriorate over time. Core competencies are so fundamental to the success of the USGS that strengthening them must be viewed as a strategic goal. While the USGS embodies each of the core competencies to some degree today, achieving excellence in all of them must be the USGS leadership's highest priority, as the USGS strives to succeed in its business activities.

Five core competencies comprise this portion of the USGS strategic plan:

- * Impartiality, Credibility, and Scientific Excellence
- * Relationships and Partnerships
- * Multidisciplinary Workforce with National Presence
- * Long-Term National Data Bases
- * Long-Term, Broad-Scale, Multidisciplinary Interpretive Studies

Goals have been established for each of these competencies.

----- CC1 -----

Core Competency 1: Impartiality, Credibility, and Scientific Excellence

Goal: Safeguard the commitment of the USGS to impartiality, credibility, and scientific excellence.

The responsibility for providing credible, impartial mapping, geologic, hydrologic and biological information to those charged with making public policy is central to the mission of the USGS. As the Nation's earth scientist, the USGS has a responsibility to provide impartial data and the most informed interpretations that advanced earth science has to offer. The reputation of the USGS is the result of the collective and individual actions of its employees. USGS scientists define scientific problems with regard to a public policy issue, interpret the data in light of that issue, and translate the information into a form that can be used by decision makers on all sides of an issue to set policy.

Opportunities exist to be an authoritative source of information in dispute resolution. The credibility of the USGS in this role depends on two essential factors --technical and scientific excellence and a reputation for impartiality. Failure in either of these areas will have a crippling effect on the organization. In particular, the reputation of the USGS for impartiality rests on being unbiased in every aspect of the USGS's mission--from collecting data and doing research to interpreting such data and communicating the results. The following actions are designed to maintain or enhance the technical and scientific excellence of the USGS, as well as its reputation for impartiality.

----- CC2 -----

Core Competency 2: Relationships and Partnerships

Goal: Sustain relationships with USGS partners and be responsive to customers.

The USGS must develop and sustain its relationships and partnerships by giving timely and responsive results to customers, and by reaching out to partners, with collegial respect. Public and private entities must form alliances to leverage resources, in order to help understand and solve societal problems that commonly have regional and sometimes global impacts. As budgetary pressures increase, the USGS will gather larger quantities of earth science data and information through and from partners.

The wide range of organizations that offer the potential for successful partnerships includes other Federal agencies, State and local government agencies, nonprofit organizations and administrative authorities, schools and universities, and the private sector. Working with the media offers unique opportunities for partnerships in presenting earth science information to the public. Individuals also can share their interests and skills with the USGS through the volunteer program.

The USGS of the future must improve and expand its relationships with customers through mutual education. The USGS has a responsibility to work with USGS customers to improve the practical value of earth science information, with particular attention to Congress as USGS's major customer and source of funding. The USGS must also educate itself with respect to USGS customers and their needs and level of satisfaction with USGS products. If USGS relationships and partnerships are healthy, USGS business activities will be healthy.

----- CC3 -----

Core Competency 3:

Multidisciplinary Workforce with National Presence

Goal: Bring diverse talent to earth science challenges of the future.

The USGS must bring diverse talents to the earth science challenges of the future. The required disciplines will vary according to society's needs, but the USGS must retain its capability to apply scientific understanding and information technology to earth science problems anywhere in the Nation. The USGS of today is a world leader in many fields related to geology, geography and cartography, biology, and hydrology. A presence in every state is a unique asset that enables the USGS to bring its national base of multidisciplinary talent to bear on important natural resource issues. It will be necessary for managers and project leaders across the country to know who has which skills and to be able to tap those skills when needed. The USGS must be increasingly flexible in USGS hiring and contractual practices, to take advantage of the full range of earth science, technology, and skills needed by USGS customers.

It is likely that the future USGS workforce will be a mix of permanent employees integrated with nonpermanent personnel on short-term work assignments, including student, post-doctoral, and contract employees. Some workforce skills will also be supplied through partnering with other organizations whose workforces possess skills outside the scope of the traditional USGS skills in the earth sciences. The USGS will use the scientist emeritus staff to help maintain continuity in major scientific studies and key long-term databases, as well as to mentor newer employees. In addition, volunteers from the public will continue to gain work experience in the earth sciences and contribute to USGS programs through short-term, specific work assignments. To remain

viable and successful, the USGS must be able to readily adjust the skills mix, size, and geographic distribution of the USGS workforce.

----- CC4 -----

Core Competency 4: Long-Term National Data Bases

Goal: Provide national leadership in maintaining earth science data and making them readily available.

The USGS must be the national leader in organizing and managing earth science data and information and making both available in useful forms. Although the USGS will continue to collect some of the data, it is more important that the USGS assume leadership in assuring that technically valid protocols are available for data collection, and seeing that long-term measurements and descriptions of the Earth are properly documented, archived, and distributed to the public. The USGS must guide the quality of long-term, national data bases to ensure that their contents are reliable and accurate. The USGS must establish itself in this role by transforming USGS data and information into usable products that customers want and need. Neither academia nor private industry is likely to compete for the role as the Nation's earth science data manager, but they, along with other nongovernmental organizations and agencies at all levels of government, will contribute to these valuable data bases, as well as be primary users of the data contained within such data bases. The development of the National Spatial Data Infrastructure (NSDI) and the National Biological Information Infrastructure (NBII) are opportunities to provide leadership and work with other organizations to ensure that nationally consistent, long-term data are available to meet current and future challenges in the earth sciences.

The USGS must ensure that its data are well managed and maintained. Good management includes finding new uses for data and ensuring that the data can be integrated and interpreted to support new understandings of earth processes. Encoding these data into digital forms and making these digital data readily accessible via the Internet and the World Wide Web are key to ensuring that USGS data continue to contribute to the Nation's well-being. The USGS also has an important collaborative role in filtering and providing quality control for earth science data produced by other organizations.

----- CC5 -----

Core Competency 5:

Long-Term, Broad-Scale, Multidisciplinary Interpretive Studies

Goal: Excel in understanding the scientific principles of earth processes.

The USGS must excel in understanding the scientific principles of earth processes. The USGS is in a unique position to apply a nationally distributed, multidisciplinary workforce to long-term, broad-scale, multidisciplinary studies. The USGS must be unsurpassed in technical ability to assimilate and interpret scientific data and information from all appropriate sources to support scientific conclusions relevant to society's needs. While the USGS as an organization will continue to conduct some scientific studies of short duration, limited scale, or narrow disciplinary scope, there will be increasing emphasis on earth science work that is much broader in scope and perhaps beyond the capabilities of other organizations.

--PART 3--

Business Activities - Goals and Performance Measures

The present and future scientific and technical efforts of the USGS are characterized as business activities. These activities were derived from the strategic planning process. Additional information about the programs may be found in the supporting documents to this plan.

The business activities were not developed as a guide for organizational or budgetary structures, but to convey the breadth, integration, and flexibility in the description of programs in which the USGS must excel over the next decade. The performance measures for the business activities were formulated on an assumption of the FY 1997 base, adjusted for inflation.

The USGS must be able to mobilize its full strengths to address high-priority concerns within and across the array of business activities. The organization also must develop innovative paradigms for prompt USGS-wide response to emerging issues. Ensuring relevance to society's needs depends on the ability to develop and communicate program priorities that are recognized, understood, and supported across organizational boundaries.

The following seven individual business activities were presented in the Strategic Plan for the U.S. Geological Survey, 1996 to 2005 that was published on June 6, 1996:

- * Water Availability and Quality
- * Hazards
- * Geographic and Cartographic Information
- * Contaminated Environments
- * Land and Water Use
- * Nonrenewable Resources
- * Environmental Effects on Human Health

The merger of the National Biological Service with the USGS on October 1, 1996 introduced an eighth Business Activity which is presented for the first time in this document:

- * Biological Resources

The discussions of the eight business activities included in this document provide statements of goals and performance measures as required by the Government Performance and Results Act and reflect the comments and suggestions provided by the Department of the Interior and Office

of Management and Budget during the formulation of the FY 1998 President's Budget. Comments and suggestions made by Congressional staff as a result of consultation meetings are also reflected. Comments from other stakeholders in response to the June 6, 1996 publication of the strategic plan, supplemented by follow up activities, meetings and interviews conducted by USGS staff, have also been accommodated within the broad policy framework established by the Administration regarding the future direction of USGS programs.

To summarize, the original text for the Strategic Plan for the U.S. Geological Survey: 1996 to 2005 that was released on June 6, 1996, has been expanded to reflect the merger of the NBS with the USGS and to establish 10 year "General Goals and Objectives" and their "Relationship to Performance Goals in Annual Performance Plans" as required by the Government Performance and Results Act. The identification of "budget activities" is provided to facilitate cross referencing of the goals and performance measures presented in this strategic plan to the commitments that are contained in the annual USGS Budget Justification to Congress. This is done in accordance with the Government Performance and Results Act which requires that proposals contained within an agency's "annual performance plan" (the budget) be linked to the overall goals presented in the strategic plan.

----- BA1 -----

Business Activity 1:

Water Availability and Quality

National Goal/Desired Outcome: Manage the Nation's water resources wisely for present and future generations. In addressing this activity, the USGS recognizes the role that States play in both water availability and water quality issues. For example, allocation of water resources is primarily a State responsibility and relies heavily on a sound knowledge of what water resources -- both ground water and surface water -- are available for allocation. Most water quality issues are regulated by State agencies through U.S. EPA guidelines provided by Federal mandates such as the Clean Water Act and the Safe Drinking Water Act. Here too, States rely on accurate water quality data and technically sound methodologies upon which to base their decisions.

Role of the USGS: Provide reliable, impartial, timely data and understanding of the quantity and quality of the Nation's water resources to enable decision-makers to plan, operate, and regulate the water resources infrastructure of the Nation, and to undertake cost-effective programs to preserve and enhance water quality.

Discussion: Water quantity is a Federal issue because water flows across jurisdictional boundaries, because of Federal water rights, and because the Federal Government is the builder and manager of many water resource projects. Water quality is a Federal issue because the government invests in water quality improvements as well as the setting of standards and goals for water quality. Because the physical health of citizens is directly affected by water quality,

there is a strong national need to share information that can be used to manage the national water infrastructure wisely. Investigations related to water availability and quality represent the largest business activity of the USGS and are likely to remain so over the next decade. Water will continue to grow in importance as an issue because the Nation faces increasing and often conflicting demands on a finite water supply--conjunctive use of water for industry, agriculture, municipal use, recreation, and fish and wildlife.

Success of USGS water investigations depends on and will continue to depend on the combination of three efforts: data collection, interpretive studies, and research. USGS water data have been crucial to designing the Nation's water resource infrastructure. USGS interpretive studies have helped water managers solve water quality and supply issues. USGS research has led to a broader understanding of hydrologic processes and also has developed methods and models that are widely used in water management. On the basis of these three efforts, the USGS is well positioned to assist decision-makers in balancing competing water demands, and to assess the long-term effects of environmental regulations and other factors affecting water resources. There is a danger that this business activity could become unbalanced and, therefore, less successful, if too much emphasis is placed on any one of these three efforts at the expense of the others.

As population increases and relocates, the overall level of water monitoring will increase in areas of high urban and agricultural water use, but it may decrease in other areas. Despite local increases in demand, shrinking fiscal resources will make it difficult for the USGS to maintain water data-collection networks at current levels, unless advancing technology substantially decreases the costs of routine monitoring and data collection. An overriding concern with respect to water information is that timely data are becoming critical, because water data are increasingly used for real-time resource management. Traditionally, the USGS has relied on its own human resources for the collection of water data. In the future, however, the USGS should be prepared to develop partnerships and assist others in this endeavor. The USGS water data bases could be greatly expanded if the USGS assimilates data from other sources. As a result, the ability of USGS to maintain long-term national data bases could be enhanced and strengthened. Increased partnering is also motivated by universities and the private sector becoming more involved in water studies, while USGS hydrologic research activities are increasingly difficult to fund fully from a single source.

Objectives and Performance Measures:

Budget Activity: Geologic Hazards, Resources and Processes

BA1-G1: By 2002, the National Cooperative Geologic Mapping Program will perform geologic investigations of critical aquifers in California, Nevada, New Mexico, South Carolina, Florida, and other States. These investigations will include geologic and surficial geologic maps,

descriptions of major units, and interpretations of their regional and subsurface extent. This information is needed by policy makers in planning appropriate strategies for ground-water use. Priorities are focused by assessment of user needs through regional workshops, advisory groups, and partnerships with State and local groups and with other government agencies.

Budget Activity: Water Resources Investigations

BA1-W1: By 2004, the National Water Quality Assessment (NAWQA) Program will complete the first round of study unit investigations. These investigations, in at least 50 study units, will account for more than half of the Nation's water use and population, and will report on the occurrence and distribution of nutrients, pesticides, volatile organic compounds, and aquatic ecology. Additionally, national synthesis activities will produce at least 6 major reports identifying primary contributing factors to nutrient, pesticide, and volatile organic compound impacts on water quality conditions. These results will begin to address the environmental conditions that result in water resources being at high or low risk to contamination.

BA1-W2: By 2000, NAWQA will complete the first national-scope, water-quality assessment report for high-level federal agency officials and the Congress that is based on consistent and comparable information collected from 20 of the most important river basins and aquifers in the nation.

BA1-W3: USGS will maintain on an annual basis a network of hydrologic monitoring stations through the Hydrologic Networks and Analysis Program and Federal-State Cooperative Water Program that will:

- (a) provide reliable and impartial streamflow data for adjudication of water allocations (based on Supreme Court decrees or interstate compacts) on the Rio Grande, Colorado, Arkansas, Republican, North Platte, and Delaware Rivers;
- (b) provide a continuous set of observations of streamflow for documenting the long-term characteristics and variability of the flow regimes of streams representative of all 86 physiographic sections of the conterminous U.S. and similar areas in Alaska, Hawaii, and Puerto Rico; and,
- (c) document the flow of more than 75% of the 352 major river basins in the U.S.

BA1-W4: The USGS recognizes the increasing need of land and water management agencies within the Department of Interior for hydrologic expertise. By 1999, the USGS will develop and implement a process which enhances its ability to meet the needs of other DOI bureaus for

analysis and interpretation of water quantity and quality information in ways that are recognized by those agencies as contributing directly to meeting their mission requirements

BA1-W5: The Federal-State Cooperative Water Program is conducted with over 1100 State and local cooperators who provide over half of the funds. By 2000, the program will develop and implement a process to collect information about cooperator satisfaction with the scientific products they receive from USGS. Beginning in 2001, and every year thereafter, USGS will ensure that at least 95% of cooperators who have a continuing need for USGS products and services renew their cooperative agreements for another year.

BA1-W6: By 2005, the USGS Ground-Water Program will have completed an assessment of a major ground-water resource issue, such as salt-water intrusion or the interaction of surface water and ground water, in one of six major regions of the country and have another assessment underway in a second region. The assessments will produce information that is relevant to and used by those responsible for water resources protection and management.

BA1-W7: By 2005, the National Stream Quality Accounting Network (NASQAN) will provide information on the trends in concentration and yields for chemicals such as nutrients, pesticides, and trace metals at 39 critical points in four of the Nation's largest river basins--the Mississippi, Columbia, Colorado, and Rio Grande. Information on occurrence of contaminants, source areas, and changes in concentration over time will be provided to land and water managers (Hydrologic Networks and Analysis program).

BA1-W8: The Hydrologic Research and Development Program conducts long-term research in support of USGS programs and initiatives. The program is focused in part on anticipating and developing methods for solving future water-resources problems and provides new process understanding, analytical techniques, approaches to field investigations, and computer models. On an annual basis, results will be transferred from at least 90% of the projects to water resources programs within and outside the USGS via scientific publications, formal training courses, and (or) through scientist to scientist interaction. Beginning in 1999 and every five years thereafter, an independent group of scientific peers will review and assess the relevance and quality of the science in the program.

BA1-W9: On an annual basis the Water Resources Research Act Program will award about 50 competitive research grants to universities. These awards help in training the next generation of water resources managers and scientists by providing support for graduate students and an opportunity for them to work on real-world water resource issues.

Budget Activity: Biological Resources

BA1-B1: By 2004, the Biological Research and Monitoring SubActivity will transfer information to natural resource management agencies on the water quality conditions and ecological relationships within wetland and aquatic environments leading to outbreaks of fish and wildlife disease. This information will assist fish and wildlife managers in addressing serious disease problems before losses impact populations.

----- BA2 -----

Business Activity 2:

Natural Hazards

National Goal/Desired Outcome: Reduce the loss of life and property from natural hazards.

Role of the USGS: (1) Advance our understanding of the fundamental processes that control or trigger hazardous events or situations, (2) Lead in developing real-time monitoring and warning systems, and (3) Enhance the use of hazards assessments by decision makers, in order to improve disaster response and mitigation planning.

Discussion: The study of hazards is an area in which the USGS will grow in the coming decade. An essential role of the Federal Government is to minimize loss of life and property that result from natural disasters such as earthquakes, volcanic eruptions, landslides, floods, and droughts. The concentration of population in urban and coastal areas increases the risk of catastrophic loss from natural hazards. In addition, the advent of the global economy increases the risk that foreign disasters will disturb the domestic economy and affect foreign policy.

Hazards-planning and disaster-response organizations require timely notification of hazardous events and information to mitigate loss from natural disasters. Improvements in monitoring networks coupled with scientifically credible interpretive studies and research into earth processes will provide the information needed by decisionmakers during crises. Advances in technologies such as real-time data analyses and cellular and satellite communications offer the opportunity to provide these services more efficiently and effectively.

Objectives and Performance Measures

Budget Activity: National Mapping Program

BA2-M1: By 1999, an infrastructure, including facilities, workstations, data manipulation hardware and software, communications networks, and operating procedures, will be in place to support a wide range of innovative and integrated applications of classified data and information for civil programs. This infrastructure will provide expanded access to, and use of, classified assets to allow more timely and more accurate development of solutions to national issues because of the historical availability, greater detail of information, and real-time nature of the classified assets.

Budget Activity: Geologic Hazards, Resources and Processes

BA2-G2: In 1999, and at 3 to 6 year intervals thereafter, the Earthquake Program will provide updated digital probabilistic shaking hazard maps and products for the entire Nation that incorporate progressively more comprehensive and robust geoscience data and knowledge. These maps will be used by the National Earthquake Hazards Reduction Program in developing seismic provisions for national building codes, by other federal agencies for design and hazard assessment purposes, and by FEMA and the insurance industry for evaluating potential future earthquake losses. In cooperation with State and local governments, the Program will prepare by 2002 digital databases and large-scale maps of earthquake shaking and ground failure hazards in three urban areas to demonstrate state-of-the-art application of geoscience information to urban hazard assessment.

BA2-G3: The Earthquake Program will conduct and support research to increase understanding of earthquake occurrence and effects for the purpose of developing and improving hazard assessment methods and loss reduction strategies. Results will be transferred to users via direct interaction with users, professional workshops and conferences, and/or scientific reports. Research grants for external research will be awarded competitively with peer evaluation. Beginning in 1999, internal research projects and the external program component will be reviewed on 3-year cycles for relevance and quality by an independent group of scientific peers.

BA2-G4: The Earthquake Program will provide national leadership for the collection, interpretation, and dissemination of scientific information on earthquakes in support of disaster response, earthquake preparedness, national security, scientific research, and public education. By 2000, the Program will integrate national, regional and local seismic monitoring networks operated with Federal support into a cooperative National Seismic System; information on potentially damaging and felt earthquakes will be reported within 10 to 15 minutes of their occurrence through the National Earthquake Information Center and existing regional centers.

By 2003, the Program, in partnership with the State of California, academia, and the private sector, will demonstrate in the Los Angeles and San Francisco metropolitan regions prototypical urban monitoring systems that distribute information about strong ground shaking tens of seconds after an earthquake occurs. The Program will continue to monitor Earth deformation related to earthquake processes in active, high-risk seismic regions and to cooperative with NASA and NSF in applying new space-based geodetic methods to deformation monitoring.

BA2-G5: At currently monitored U.S. volcanoes, the USGS will conduct monitoring activities at the level required to identify and respond to volcanic unrest, as measured by issuance of notifications and warnings to the public and emergency-management officials and by timely crisis response in partnership with appropriate land managers.

BA2-G6: By 2003, the USGS will construct a comprehensive digital geospatial database that integrates the spectrum of data on volcanic centers produced by the USGS (including geologic and hazard-assessment maps and data from monitoring networks) into a common electronic structure publicly available for research and information queries.

BA2-G7: The Landslide Program will assist Federal, State, and local agencies by investigating landslide disasters in the U.S. which cause major damage and/or loss of life and by recommending strategies to mitigate damage. This assistance will provide the scientific basis for decisions by emergency managers and by land and facility managers regarding actions to limit current and future landslide losses. In cooperation with State and local agencies, the Program will conduct regional assessments of landslide hazards in areas of high potential loss. The first regional assessment will be completed by 2002.

BA2-G8: The Geomagnetism Program will maintain and operate the national network of geomagnetic observatories and disseminate information and data about the Earth's magnetic field to domestic and foreign government agencies, industry, academia, and the public. The Program will provide real-time geomagnetic hazard and space weather information to users, such as satellite and electric power grid operators, whose activities are adversely affected by solar storms and geomagnetic disturbances. In the year 2001, the Program will produce updated five-year charts of the Earth's magnetic field and compute mathematical models that forecast slow changes in the magnetic field in both space and time. These charts and models are used by the nation's transportation infrastructure for navigational applications, including Global Positioning Systems operated by the Department of Defense.

BA2-G9: The USGS, in cooperative with the NSF and the Incorporated Research Institutes for Seismology (IRIS), will continue to deploy and operate the Global Seismographic Network (GSN), which provide data in support of seismic monitoring of the Comprehensive Test Ban Treaty, foreign disaster response, and research on earthquake processes and earth structure. The network currently comprises 102 stations, 66 of which the USGS is directly responsible for

operating and maintaining as of FY 1998. The overall operational goal for stations under USGS responsibility is 85% data availability from 70% of the stations.

BA2-G10: In 1998, the Coastal and Marine Program will undertake a nation-wide scientific assessment of coastal and nearshore hazards, including coastal erosion, earthquakes, landslides, and tsunamis. Digital computer data bases as well as interpretative maps and reports will be made available to a wide range of clients including states, Federal agencies, local agencies, insurance companies and the public.

BA2-G11: By 2002, the National Cooperative Geologic Mapping Program will have completed a series of digital geologic maps of areas subject to earthquake, landslide, and volcanic hazards in the Pacific Northwest (Portland-Seattle region), in southern California, in Colorado, in the mid-continent region, and in the southern Appalachians. These data will provide the geologic foundation for land-use decisions by Federal, State, and local policy makers. Geologic maps of areas subject to earthquakes will be the basis of digital (geographic information system) analyses of economic and natural hazard risks. Analyses of this nature are needed by policy makers to minimize the expense of natural hazard mitigation and remediation. Priorities are focused by assessment of user needs through regional workshops, advisory groups, and partnerships with State and local groups.

Budget Activity: Water Resources Investigations

BA2-W10: The Hydrologic Networks and Analysis Program will provide an information system on the Internet for estimating the flood potential at any point on any unregulated stream in the U.S. by 2000. Flood frequencies based on historical hydroclimatic relations for 25% of the states will be updated and added to the Internet system by 2005.

BA2-W11: By 2000, the USGS, through the Hydrologic Networks and Analysis and the Federal-State Cooperative Water Programs, will add telemetry to 200 existing streamflow gages and provide real-time data for flood warning. By 2005, telemetry will be installed at an additional 300 streamflow gages.

BA2-W12: The Water Information Delivery Program will support the public safety by providing real-time water level and streamflow data on the Internet for streams in every state by the end of 1997. This information can be used by State and local officials to make rapid decisions on flood control measures and possible evacuation of people. This will be coupled with an aggressive program to educate State and local officials on the availability and means of access to these real-time data.

----- BA3 -----

Business Activity 3:

Geographic and Cartographic Information

National Goal/Desired Outcome: Provide maps and map data for the Nation.

Role of the USGS: Acquire, produce, manage, and disseminate geospatial data; cultivate partnerships with other governmental organizations, academia, and the private sector for those activities; provide leadership in establishing national geospatial data policies and standards; and conduct a geographic research and development program focussed on interpretation and application of geospatial data.

Discussion: Coordination and collection of geographic and cartographic information will remain a fundamental Federal role and a viable program of the USGS. Knowledge of the location of and relations among natural and manmade features at and beneath the Earth's surface provides a framework for analyzing and understanding earth processes, and for making wise decisions. Public- and private-sector organizations depend on this information as the basis for wise economic and physical development, management of resources, response to and mitigation of hazards, and many other uses. The USGS has traditionally been a major supplier of this information not only to its internal operations, but to other public- and private-sector organizations as well.

Technology is causing a transition from traditional data collection and integration processes to digital processes, thereby improving quality and efficiency as USGS products are redefined. The proliferation of digital capabilities also increases the availability of geographic information from other public and private entities. This increasing volume of data drives the need for new technology, and expands the potential for data applications and increased coordination and outreach.

Advancing technical capabilities such as global positioning, remote-sensing satellites and Geographic Information Systems (GIS) are revolutionizing the ability to determine precise geographic positions and to identify geospatial features. These capabilities are challenging assumptions about the means and types of data that should be collected. The Internet also offers coordination and outreach opportunities for the USGS to leverage resources and become a leader in a collaborative effort to create and maintain geographic and cartographic data.

Objectives and Performance Measures:

Budget Activity: National Mapping Program

BA3-M2: The Mapping Data Collection and Integration Program will complete and maintain a suite of national data sets responsive to customer priorities and requirements. Dates for selected components of this suite of national data sets are:

- by 1999, high-resolution digital elevation data for the conterminous United States, Alaska, and Hawaii will be complete;
- by 2000, a topographic map maintenance strategy will be in place that increases map revisions by a factor of three from the FY 1996 level;
- by 2002, a system of policies, partnerships, and processes will be in place to maintain the quality and currentness of the National Hydrography Data Set; and
- by 2004, digital ortho-imagery for the conterminous United States, Alaska, and Hawaii will be complete.

Federal, State, and local government agencies find these maps and map data extremely critical for management of public resources, for safeguarding citizens and property, and for providing a wide range of other governmental services. These products make possible a wide variety of analyses and applications, support policy determinations and decisionmaking, enhance the capability for monitoring of economic and environmental conditions, and for reporting events and changes to the public.

BA3-M3: The Earth Science Information Management and Delivery Program will manage and deliver an increasing volume of geospatial data, including data from classified sources, to enable policy officials and program managers to make wise and informed decisions when facing critical national issues. Significant milestones of this effort include:

- by 1999, more effective tools and processes will be in place to achieve easy, timely, and consistent access to and delivery of USGS information and products to a wide range of customers; and
- the volume of geospatial and remotely sensed data archived and managed by the National Mapping Program will increase each year.

This effort by the USGS will ensure the long-term availability of geospatial and remotely sensed data and will enable access to the data by a broader community of users.

BA3-M4: The Geographic Research and Applications Program will synthesize thematic spatial data from various scientific and cultural fields to promote creative solutions to resource and development issues. Objectives of this endeavor will include:

- by 2000, policies and procedures will be in place to ensure that modernized automated mapping systems are maintained to support national needs; and
- by 2002, innovative geospatial data integration and applications will be implemented in multidisciplinary science activities, such as the initiatives for Geologic and Hydrologic Urban Hazards and Abandoned Mine Lands.

New technologies and procedures for automated integration and analysis of all data related to an issue will ensure faster and more comprehensive investigations with more accurate results that can be used in formulating land and resource policies.

BA3-M5: Through the National Spatial Data Infrastructure (NSDI), the National Mapping Program will reduce duplicative effort at all levels of government and leverage maximum benefits from limited resources for geospatial data collection and maintenance. Results from this effort will include:

- through FGDC leadership and interagency coordination, the amount of basic geospatial data identified and made available through the NSDI clearinghouse, especially from non-Federal data producers and maintainers, will increase each year; and
- long-term partnerships, developed with other Federal agencies, State and regional GIS councils, and other appropriate coordinating entities for shared data collection and maintenance, will increase in number through the next five years.

Budget Activity: Geologic Hazards, Resources and Processes

BA3-G12: By 2002, the National Cooperative Geologic Mapping Program will implement a digital geologic map data base of the nation on the Internet. This data base will serve as the nation's electronic index for geologic map data provided by Federal, State, and University led projects and investigations. USGS contributions to this data base include coordination of work by partners and with the National Spatial Data Infrastructure and FGDC, development of standards and procedures, construction of a gateway to geologic maps on the Internet, and national regional mapping and digital compilation. Rapid digital access to a nation-wide data base of geologic map information is needed at all levels of government for policy and land-use decisions, and by the private sector as background for consultation services. Implementation of the national data base will be guided by technical workshops, working groups, and by partnerships with State agencies. Also by 2002, the program will contribute to the geologic map and information needs requested by the National Park Service at ten or more NPS sites across the nation.

Budget Activity: Water Resources Investigations

BA3-W13: By 1999, the Ground-Water Resources Program will have completed a National Ground Water Atlas that will serve as a key reference and educational resource on the Nation's ground-water system for the public as well as for Federal, State, and local managers. By 2005, the Ground-Water Resources Program will have developed a digital national hydrogeologic data base that will have evolved from the National Ground Water Atlas. The data base will contain digital information on essential features of the Nation's major aquifers and be readily accessible over the internet.

Budget Activity: Biological Resources

BA3-B2: By 2004, the Biological Information Management and Delivery Program will provide geospatial information needed for assessment and management of biological resources, including Gap Analysis projects (complementary maps of natural land cover, vertebrate species, and land management status that together identify those species and natural communities that are not adequately represented in lands managed for conservation), vegetation maps, habitat maps, and species range and population trend maps. This information is used by USGS partners to manage public lands, protect biodiversity, and assist in restoring and monitoring high priority habitats.

----- BA 4 -----

Business Activity 4:

Contaminated Environments

National Goal/Desired Outcome: Reduce both environmental contamination and the cost of cleaning up existing contamination.

Role of the USGS: Identify and define the occurrence and effects of contamination, broaden our basic understanding of contaminant hazards, and provide pertinent information to those concerned with mitigation and prevention.

Discussion: Nuclear waste disposal, hazardous toxic substances entering the Nation's water supply and the food chain, and atmospheric transport and deposition of toxic materials are serious threats to the human and environmental health of the United States. Society must deal with the legacy of contaminated sites, accidents involving hazardous substances, and increasing quantities of toxic waste. Locally, toxic substances can pose a significant risk to public health and the environment.

Some hazardous and toxic substances are anthropogenic, whereas others are occurring naturally. Contaminated environments are not entirely a domestic concern; development along the United States-Mexico border threatens water supplies and public health on both sides of the border, Russian nuclear waste in the Arctic Ocean potentially threatens U.S. territory, and atmospheric movement of persistent organic chemicals is global in extent.

Several current USGS programs focus on contaminated environments both on land and in the oceans, with some of this work supported by outside funding. Most of the work funded by outside sources is narrowly focused on specific sites. However, the USGS has a unique capability for the long-term, multidisciplinary study of contaminated environments. This capability enables the USGS to take a broader view of contamination problems, build an understanding of how contaminants move through the natural environment, identify potentially sensitive environments, and help to assess the effectiveness of various environmental regulations. The emphasis of this activity will increasingly be on projects that integrate disciplines and/or allow work on larger geographic areas. This activity currently represents one of the larger business activities of the USGS and seems to have considerable growth potential.

Objectives and Performance Measures:

Budget Activity: Geologic Hazards, Resources and Processes

BA4-G13: By 1999, the Coastal and Marine Program will develop rapid and cost effective equipment and methods of surveying and assessing contaminated sediments in coastal and estuary environments at several locations around the U.S. Such information in the form of data bases and interpretive maps will provide the scientific basis for restoring and protecting coastal areas.

BA4-G14: By 2002, the Mineral Resources Program will complete regional environmental baseline studies in Alaska, Yellowstone National Park, the Pacific Northwest, and southern Arizona and regional watershed-based abandoned mine land studies in Colorado and Montana. The environmental baseline studies will describe processes controlling source, transport, and fate of metals and characterize baseline and/or background concentrations of metals resulting from natural and anthropogenic sources. This information will allow local, state, and Federal planners to set realistic, cost-saving standards for remediation of abandoned mine sites. The abandoned mine land studies support remediation goals of Federal land managers and local agencies and provide a comprehensive understanding of the distribution and sources of contamination.

Budget Activity: Water Resources Investigations

BA4-W14: The Toxic Substances Hydrology Program will provide scientific knowledge and methods that will improve the effectiveness and reduce the cost of identifying and reducing risk to human and ecosystem health for ground-water contamination sites affected by petroleum products (including gasoline), chlorinated solvents, mixed wastes from municipal landfills, treated sewage effluent, and agricultural chemicals. As an example, by 1999, a preliminary evaluation will be made of the implications of the presence of MTBE (a gasoline additive) on long-term strategies using natural attenuation (passive remediation) to remediate ground water contaminated by gasoline.

BA4-W15: The Toxic Substances Hydrology Program will provide scientific knowledge and improved methods for characterizing the effects of pesticides and other agricultural chemicals, and selected trace metals on aquatic ecosystems. Results can be used to design monitoring programs, develop environmental standards, and manage protection of aquatic ecosystems. As examples, by 1999, an investigation will be designed to provide a "report card" on the health of the Nation's aquatic ecosystems with respect to atmospheric mercury contamination, and by 2000, a preliminary evaluation will be provided of the occurrence of selected chemicals associated with cotton agriculture in surface waters in a major cotton producing region in the south central U.S.

BA4-W16: By 1999, the National Water Quality Assessment Program (NAWQA) will provide annually, consistent and comparable information on the occurrence and distribution of pesticides in important streams and aquifers in agricultural settings nationwide to assist pesticide manufacturers and the U.S. Environmental Protection Agency in the re-registration of these compounds.

Budget Activity: Biological Resources

BA4-B3: By 2004, the Biological Research and Monitoring Subactivity will provide additional baseline databases and scientific knowledge that are needed for interpreting results from site-specific assessments, additional tools for identifying and characterizing effects of environmental contaminants on living resources, and frameworks for assessing contaminant threats to lands and species and for monitoring impacts of mitigation and remediation actions. These scientific outputs will provide natural resource managers with cost-effective, efficient methods for understanding the impacts of contaminated environments at both a local and regional scale.

----- BA 5 -----

Business Activity 5:

Land and Water Use

National Goal/Desired Outcome: Improve the land and water use decisions made by the public and private sector.

Role of the USGS: Provide integrated earth science information about land and water use in support of management and other policy decisions, develop analytical tools for improved decision making, and enhance the understanding of how natural processes at the Earth's surface are affected by changes in climate or land/water use.

Discussion: Sound stewardship of the Nation's land and water resources requires up-to-date synoptic data on how land and water resources are being used, as well as an understanding of how possible changes in use might impact the national economy, the environment, and the quality of life for people. The USGS needs to find new ways to translate this information into forms that can be used by makers of public policy, the business community, and individuals. The USGS is uniquely qualified to undertake this activity, because of its mix of scientific and technical skills and its capabilities to design and manage large geospatial investigations and data bases, and because the organization is perceived as impartial and unbiased.

Earth science information required to make decisions about the availability and use of natural resources, including land, is inherently multidisciplinary. The USGS has extensive experience incorporating a multidisciplinary approach to decision making about resource availability. For example, to aid land resource planners and decisionmakers in the Powder River Basin, USGS combined coal resource information with knowledge about the surrounding geology, hydrology, and land use to provide guidance about coal availability and cost of extraction. Other examples include USGS involvement in the debate over resource development in the Arctic National Wildlife Refuge (ANWR), in delineating the effects of the 1993 Mississippi River floods, and in ecosystem studies in the Florida Everglades and the San Francisco Bay Area.

This business activity is a growth area for the USGS over the next decade, but this growth will require careful definition of the appropriate Federal role and will be conducted largely through partnerships with other organizations. There is a recognized Federal role when large tracts of Federal lands or national policy are involved, as in the case of the Alaska pipeline, ANWR, the Florida Everglades, or reconstruction after the Mississippi River floods. A Federal role may also be appropriate in partnerships with multiple states for planning land and water use in areas

such as the lower Missouri River corridor, the Ohio River corridor, or in developing suburban areas such as the Northeast corridor. Finally, a Federal role may be evident in developing areas that involve Federal or tribal lands, multiple Federal installations, or where specific chronic earth science problems exist, such as swelling soils and subsidence owing to ground-water withdrawal or melting permafrost.

Objectives and Performance Measures:

Budget Activity: National Mapping Program

BA5-M6: By 2000, the USGS, in collaboration with the Multi-Resolution Land Characterization (MRLC) consortium, will develop a nationally consistent 30-meter land cover data set for the conterminous United States. Landsat Thematic Mapper data will be processed by Federal region, using a consistent protocol and classified following the nationally consistent hierarchical legend adopted by the MRLC partners. These land cover data sets will be centrally archived at the EROS Data Center, with on-line access to all users through the MRLC land cover clearinghouse currently in development.

Budget Activity: Geologic Hazards, Resources and Processes

BA5-G15: By the year 2002, the National Cooperative Geologic Mapping Program will complete both 1:24,000-scale geologic maps and 1:100,000-scale geologic map compilations in four major urban areas of the nation as a foundation for land- and water-use planning. These investigations will focus on urban areas in the Pacific Northwest, the San Francisco Bay area, the greater Los Angeles metropolitan area, the major urban corridor between Washington, DC and New York City, and in urban corridors of the mid-continent. These studies provide essential information to policy makers on land use, ground water availability and contamination, toxic wastes from industry, and deactivation of military establishments. In cooperation with other USGS programs and numerous other agencies, the NCGMP will by 2002, have contributed to assessments of environmental baselines in South Florida, and the Chesapeake Bay. These assessments will be used by planners and regulatory agencies in determining policy for land and water-use and for environmental restoration in both of these areas. Priorities are focused by assessment of user needs through regional workshops, advisory groups, and partnerships with State and local groups.

BA5-G16: The Earth Surface Dynamics Program will continue to characterize and make available information on the past and present variability of Earth's climate and environment with emphasis on variability that impacts lands and resources of the nation on decadal to millennial time scales. The information can be used to establish the limits of likely future changes and help separate any human-related change from natural variability. By FY 2000, an initial assessment of climate variability during two recent climatic warm intervals will be completed. The assessment

will provide an estimate of the magnitude and potential for rapid natural climate variability during warm climates.

BA5-G17: By FY 2000, the Earth Surface Dynamics Program will construct a prototype model for climate-related land-surface changes in the southwestern United States. Model results will incorporate simulations of the equilibrium geographic distribution of 100 major tree and shrub species. The model will provide land and resource management officials with estimates of the changes to the distribution of individual species, associations of species, and land form changes under different scenarios for climatic conditions.

BA5-G18: By FY 2001, the Earth Surface Dynamics Program will develop and make available a GIS for the arid and semi-arid southwestern US that incorporates geologic, biologic, meteorologic and topographic data to assess response of the land surface to changes in climate and land use. The GIS will be a decision-support system for land and resource managers and will be used by USGS to forward model the response of the land surface to change and to identify areas that are most vulnerable to likely climate variability.

BA5-G19: Land and natural resource management agencies throughout the Federal Government have adopted ecosystem management for their operations, and need readily available scientific information to implement it. In South Florida, \$2 billion to \$3 billion decisions will be made in the next few years about which path to follow to restore the Everglades and Florida Bay. In San Francisco Bay, contentious water-management decisions require USGS information for implementation. In Chesapeake Bay, implementation of changes in land use practices requires information on the effects of those practices on nutrient and sediment loading into Chesapeake Bay. The efforts of the interagency Chesapeake Bay Program to restore the vital functions of the Chesapeake Bay is estimated to cost one-half billion dollars per year for modeling, monitoring and implementation of management strategies such as upgrades to sewage treatment plants, and changes to agricultural practices. By the year 2002, USGS will provide hydrologic and ecological models, model components, and scientific information that Federal and State agencies in South Florida and San Francisco Bay can use to understand the functioning of the ecosystem so that they can evaluate alternative management strategies. By the year 2000, USGS will collect and interpret scientific information that can be used by the interagency Chesapeake Bay Program to determine the effectiveness and response of Chesapeake Bay to the nutrient-reduction strategy, and the relationship changes caused by nutrient management to those caused by natural factors and variability.

Budget Activity: Water Resources Investigations

BA5-W17: By 1998, the National Water Use Information Program (Federal-State Cooperative Water Program) will complete a national water-use compilation and publish a USGS circular on Estimated Use of Water in the United States in 1995. Water-use estimates for 1995 will be

available on the Internet for every county, hydrologic cataloging unit, and major aquifer system in the United States, Puerto Rico, and the Virgin Islands. National trend information will be available for the period 1950 to 1995 at 5-year intervals. A national aggregate database and state site-specific databases will be available to assist decision makers and the general public on water-use issues.

BA5-W18: By 2000, the USGS will have completed development, testing, documentation, and distribution of a user-friendly watershed decision-support system that couples hydrological process models with resource-management models; with expanded capabilities that incorporate ecological process models by 2005 (Hydrologic Networks and Analysis Program).

Budget Activity: Biological Resources

BA5-B4: By 2004, the Biological Research and Monitoring Program will transfer information to partners in land and water management agencies on natural ecosystem and landscape processes at the land/water interface and the impacts of various land use patterns on biological resources in important coastal and interior wetland ecosystems of the United States. This information is needed to support land and water management and policy decisions in these regions.

----- BA6 -----

Business Activity 6:

Nonrenewable Resources

National Goal/Desired Outcome: Enhance economic development and growth.

Role of the USGS: (1) Determine the location, quantity, and quality of nonrenewable resources both internationally and domestically, (2) Determine the environmental effects of resource extraction and use, and (3) Improve assessments of resource potential, making possible the formulation of the best strategies for development of future resource supplies.

Discussion: Investigations of nonrenewable resources will undergo fundamental changes during the coming decade, and such investigations will likely decrease as a percentage of the total USGS effort. Studies of metallic minerals and fossil fuels have been at the core of the USGS's activities for more than a century. Increasing dependence on international sources for many mineral and energy commodities signals a shift from exploration for domestic reserves to identifying and characterizing conventional and unconventional sources throughout the world. Successful national economic policy now depends on knowledge beyond that of locations and quantities of these resources. Knowledge also is necessary about economic, social, and

environmental costs; quality; and availability of these resources, especially as potentially influenced by shifting political situations and technological innovations.

The focus of domestic studies will be on completing undiscovered resource assessments, both onshore and in the Exclusive Economic Zone (EEZ), and on identification and mitigation of potential problems caused by resource extraction on Federal lands. Important strategic opportunities also include such nontraditional areas as non-metallic minerals and aggregate, in-situ mining and its environmental impacts, and in mined land remediation and associated resource recovery. Finally, continued development and refinement of genetic models based on domestic and foreign occurrences will remain an essential part of the nonrenewable resource activity.

Objectives and Performance Measures:

Budget Activity: Geologic Hazards, Resources and Processes

BA6-G20: By 2001, the Energy Resources Program will have completed a National Coal Assessment and Geographic Information System (GIS) linked to the Federal Land ownership GIS coverage, resulting in improved land management capabilities.

BA6-G21: By 2002, the Energy Resources Program will have completed a World Oil and Gas Assessment and Geographic Information System (GIS), resulting in improved international policy and strategic decision making capabilities for the Nation.

BA6-G22: By 2003, the Coastal and Marine Program will have developed a digital data base from regional assessments of offshore marine sand and gravel mineral resources around the continental shelf and Great Lakes regions of the U.S. Information from these studies is useful to Federal and State agencies and industry to manage aggregate resources for onshore use and for beach nourishment to mitigate coastal erosion.

BA6-G23: By 2000, the Mineral Resources Program will have completed 30 resource assessments of National Forests and BLM Resource Areas for the USFS and BLM and five ecosystem support studies in the Interior Columbia Basin, Florida Everglades, Yellowstone Basin, Joshua Tree National Park, and the Colorado Desert District for the USFS, BLM, and NPS. Resource assessment studies are used by the USFS and BLM to make land management decisions related to the ecologic health of the land, environmental quality, and resource availability. Ecosystem support studies provide land managers with digital geologic, geochemical and geophysical information that can be used as part of a decision support system to locate nutrient sources, understand the source, transport and fate of contaminants that impact biota, and restore ecosystem health.

BA6-G24: By 2002, the Mineral Resources Program will complete studies of infrastructure resources in the Rocky Mountain Front Range and the Mid-Atlantic Urban Corridor. These studies emphasize both availability and materials flow of natural aggregate and will produce geospatial databases in a decision support system to assist land managers in planning, monitoring and forecasting the flow of aggregate and related materials through use, reuse, and disposal. On a recurring basis, the Program will conduct regional mineral assessments that will be compiled every five years into a national assessment for selected hard rock and industrial minerals. Recurring regional assessments provide critical information for federal land managers on the potential for the occurrence of mineral resources and subsequent environmental and economic impacts with development of these resources for district, park, and forest land management plans and for daily decision making. Recurring national assessments contribute information to Federal policy makers concerned with materials flow issues of economic supply, demand, consumption, and disposal. On monthly, quarterly, and annual basis, the Program produces domestic and international commodity reports for critical commodities and develops monthly leading and coincident indices of metal prices for the major domestic metals. These reports are used by the Federal Reserve Board, other economists, banks, and planners to analyze the effects of the business cycle on future production. Commodity information and work on material flow are used by a broad spectrum of policy makers in government and industry to analyze the materials flow through society and the economy and to make best use of our natural resources. Commodities work on material flows includes the development of a database of materials consumption by end use, including recycling and disposal, and the development of a methodology to analyze materials consumption by economic and industrial sectors of the economy and quantify the amount of (and which) materials are embedded in manufactured imports and exports.

----- BA7 -----

Business Activity 7:

Environmental Effects on Human Health

National Goal/Desired outcome: Reduce risks to human health from hazardous chemicals and disease-causing organisms.

Role of the USGS: Provide information on the occurrence of environmental toxins and pathogens and the factors affecting fate and transport of these agents from their sources to humans.

Discussion: This is a new business activity that draws on the USGS' multidisciplinary expertise. Earth scientists have not traditionally played a substantial role in addressing human health issues. An increasing proportion of the Federal budget, however, is dedicated to health

issues, and many chronic health issues may relate directly to earth processes and the environment. As the Nation's earth science agency, the USGS can play a significant role in understanding environmental contributions to diseases. As the USGS assumes a role in this issue, managers will need to define an appropriate niche, relative to traditional health and environmental agencies, and form strong partnerships to collaborate on problem solving.

Work by the USGS has already contributed to understanding the effects of radon, asbestos, selenium, chromium, and uranium on human health. Ongoing research on bacterial and virus transport in ground water and bioaccumulation of metals such as arsenic, mercury, and lead also address public health issues. The USGS has considerable experience in conducting studies on the occurrence and distribution of natural and manmade organic chemicals that can affect human health. Human exposure to potentially toxic chemicals through plants and animals in the food chain is another area of concern in which the USGS can lend its expertise. Water quality remains an important concern in health and medicine, and the USGS already has a significant role in helping others determine the best methods for monitoring drinking-water quality.

In the field of disaster epidemiology, earth science information is important to understanding the movement of waterborne and airborne pathogens that proliferate following some floods, earthquakes, and disruptions of water supplies. The USGS scientists also have in-depth knowledge about volcanic ash, and this knowledge is important to public health officials as they investigate the consequences of inhaling volcanic ash as well as volcanic gases and aerosols.

Objectives and Performance Measures:

Budget Activity: Geologic Hazards, Resources and Processes

BA7-G25: By 2001, the Mineral resources Program will complete regional studies in Alaska and California on the transport and fate of mercury from both mined and unmined sources and its impact on fisheries and regional studies on the transport and fate of arsenic in Alaska, California, and Alabama. The mercury studies provide the characterization of mercury phases and speciation that is required for scientifically sound bioavailability studies, which determine how much of the toxic forms of mercury is available in the food chain. Characterization of environmental behavior of both mercury and arsenic will aid in determining realistic remediation strategies and acceptable levels of exposure to these potentially harmful minerals.

Budget Activity: Water Resources Investigations

BA7-W19: By 2000, as part of the Drinking Water Initiative, the National Water Quality Assessment (NAWQA) Program and the Federal/State Cooperative Program will have

accomplished the following objectives toward the goal of providing a better understanding of the occurrence and causes of contaminants in the Nation's drinking-water source areas:

- o Evaluate current and improved methods for detecting waterborne cryptosporidium, the disease-causing protozoan.
- o Evaluate the geologic and hydrologic controls on arsenic in southeastern Michigan, so that they may be compared with levels of arsenic in humans, and with similar high-arsenic areas across the country.
- o Evaluate the vulnerability of drinking-water supplies in New Jersey to contamination by radionuclides. Joint studies with State agencies will evaluate the relation of geologic sources of radionuclides to cancer risk.

BA7-W20: By 2002, NAWQA will provide on an annual basis consistent and comparable information to major water utilities, the U.S. Environmental Protection Agency, and the general public on the occurrence and distribution of trace elements, pesticides, and other potentially toxic contaminants for major watersheds and aquifers used to guide monitoring of drinking water supplies in support of the Safe Drinking Water Act and the President's "Right to Know" Kalamazoo initiative.

----- BA8 -----

Business Activity 8:

Biological Resources

National Goal/Desired Outcome: Conserve and manage the Nation's biological resources for present and future generations.

Role of the USGS: Provide reliable, impartial and timely data on the status and trends of the Nation's biological resources, to provide an understanding of biological systems, and to assess natural and human induced changes to those systems.

Discussion: America's abundant living resources provide a significant foundation for the wealth and well-being of our Nation. Wise stewardship of these resources requires a thorough understanding of the complex ecological processes that maintain living systems. This understanding is a prerequisite to ensuring that the aspirations of society are not compromised by unintended modification to living resources and the ecological systems that sustain them.

The public is becoming more aware that habitat loss and fragmentation, land-use change, contaminants, the invasion of non-native species, and other relatively rapid impacts to the biosphere, threaten the integrity of ecological systems and, consequently, the quality of life. At the same time, Federal and state land and resource managers face many pressing challenges including: maintaining an adequate habitat base of sufficient quality to sustain the Nation's biota at desired population levels; mitigating the impacts of invasive species including plants, animals, and diseases; managing fragmented landscapes while protecting natural processes; evaluating the effects of water allocation, consumption and use, and maintaining viable populations of plants and wildlife.

Sound choices about the use and conservation of living resources requires that decision makers have access to impartial, scientifically credible resource information. Additionally, postponing responses until environmental issues become crises reduces available options and often results in unnecessary conflict over a diminished resource. Developing and deploying tools for understanding living systems, predicting how they will respond to stresses, and anticipating rather than reacting to problems will allow responses that are measured rather than rushed, system-wide rather than species specific.

The consolidation of the former National Biological Service with the USGS offers an important opportunity to develop a more comprehensive understanding of the earth's life-sustaining physical and biological systems. Key areas for biological research over the next five to ten years will focus on providing critical science information to aid decision makers in the management of biological resources. Additional emphasis will be placed on sustaining strong partnerships with other Interior bureaus and state agencies and supplying unbiased technical information that will help solve real problems in the areas of fish and wildlife management and conservation biology. New areas of coastal and wetland research will build upon the multidisciplinary capabilities of USGS by integrating geology, biogeochemistry, and hydrology with biological sciences to advance our understanding of ecosystem processes. Research will produce much needed tools for restoration of important biological communities emphasizing imperiled species and ecosystems. Standards and protocols for assessing the status and trends of key plant and animal populations will be developed, as well as new methodologies for understanding and controlling the introduction and spread of exotic species. Moreover, USGS will continue to increase accessibility of critical biological data to partners and stakeholders by supporting electronic databases through NBII and developing models and expert systems.

Objectives and Performance Measures:

Budget Activity: Geologic Hazards, Resources and Processes

BA8-G26: By 2002, the Coastal and Marine Program will have completed detailed mapping of the seabed habitats in two marine sanctuaries and work will continue on mapping and characterizing the other marine sanctuaries around the nation. Such scientific data and information is needed to manage and protect the sanctuaries and living resources.

Budget Activity: Biological Resources

BA8-B5: The Biological Research and Monitoring Program will supply, on an annual basis, information on the status and trends of biological resources given high priority by resource management agencies, and will provide standardized techniques for the inventory, monitoring, and assessment of those resources. By 2000, USGS will increase production of its regularly supplied status and trends reports and information on standardization of techniques. This information is critical for the effective management and conservation of biological resources by federal, state, and private land and resource managers.

BA8-B6: By 2005, the Biological Research and Monitoring Program will provide information needed to assess the status or restore the ecological function of degraded ecosystems given highest priority by resource management agencies, such as coastal and interior wetlands, Great Lakes fisheries and habitats, Chesapeake Bay living resources, interior grasslands, and riverine, stream, and riparian habitats.

BA8-B7: By 2005, the Biological Research and Monitoring Program will develop tools effective for the evaluation, prevention, and control of the spread of invasive plants and animals of highest priority to natural resource management agencies. These species may cause significant harm to natural communities and result in large economic losses. Information will be transferred to management agencies on the distribution, impacts, and ecology of invasive species of highest concern. Research will focus on strategies and methods for maintaining healthy, balanced ecosystems that are resistant to invasions of nuisance species.

BA8-B8: By 2004, the Biological Research and Monitoring Program will identify whether endocrine disrupting synthetic compounds and other toxic compounds in the environment have the potential for adversely affecting wild populations of major groups of terrestrial and aquatic animals. This information is essential to assure chemical safety and minimize threats to fish and wildlife populations.

BA8-B9: The Biological Research and Monitoring Program will provide, on an annual basis, critical information to be used by land and resource management agencies to fulfill federal responsibilities for managing species for which the Department of the Interior has stewardship responsibilities, including information on anadromous fish and migratory bird populations.

BA8-B10: The Biological Research and Monitoring Program will provide, on an annual basis, biological information requested by partners to enable effective, sustainable management of public lands including information needed to determine the potential risk, scope, severity, and behavior of wildfires in forest, rangeland, and grassland ecosystems.

BA8-B11: By 2002, the Biological Research and Monitoring Program will provide information to natural resource managers on the biology and ecology of imperiled species and species at risk of highest concern to resource managers. This information will assist resource managers in reversing population declines.

BA8-B12: The Cooperative Research Units Program will maintain a direct linkage with states and academia through a national program to coordinate information needs and resources to annually: 1) address 200 new information needs; 2) complete 200 research projects to the satisfaction of project sponsors and cooperators, and; 3) train 90 future natural resource professionals through research programs and academic ties. The program offers quick response to rapidly evolving information needs, and achieves cost effective approaches and solutions through the integration of information requirements and resources of local, state, and federal agencies with a mandate to conserve and manage fish and wildlife populations, including migratory birds, anadromous fish, endangered species, and associated habitats. Students trained through this program meet the personnel needs of state and federal resource and land management agencies.

BA8-B13: The Biological Information Management and Delivery Program will continue to provide greater electronic access to all types of biological information through the National Biological Information Infrastructure (NBII). This information can then be used by government agencies, private industry, and the public to support better understanding and management of our biological resources. By 1999, the amount of biological information resulting from USGS-conducted research and inventory that will be available on the Internet through the NBII will have doubled since 1996. The USGS also will continue to expand the number and types of significant non-USGS sources of biological information available through the NBII by implementing partnerships with other government agencies and private organizations. By 2002, the amount of biological information from non-USGS sources that will be available through NBII will have doubled since 1997. By 2005, the amount will have doubled since 2002.

BA8-B14: By 2005, the Biological Information Management and Delivery Program, in conjunction with our public and private partners, will have implemented an “electronic national natural history museum” on the Internet/World Wide Web which will provide scientists,

resources managers, and the American public with rapid access to information on the biological specimens in at least 50% of all the natural history collections in the U.S. Increasing access to this information will greatly enhance our understanding of the biological diversity of the Nation, and of changes in our biological resources over the last 150 years.

BA8-B15: By 2000, the Biological Information Management and Delivery Program will have implemented a set of national standards for describing, formatting, and exchanging biological information of all types. Use of these standards by public and private agencies and organizations will mean that information on biological resources can be more readily found, shared, aggregated, and used for many different purposes.

-- **PART 4** --

Description of How General Goals and Objectives Are Achieved

A. Program Management

The Director manages the USGS through three councils: the Policy Council, the Science Council, and the Operations Council.

The **Policy Council** is the main leadership and decisionmaking body at the bureau level. The Council is responsible for: strategic planning; prioritization and promotion of programs and initiatives; budget strategy; and bureau policy guidance and direction for support services, information management, human resources coordination, external coordination and infrastructure. The Council effectively integrates science, management, and policy and serves as the connection between long-term goals and short-term political realities. The Policy Council is assisted by the Science Council and the Operations Council.

The **Science Council** is responsible for assisting the Policy Council in charting the scientific and technical direction of the Bureau through strategic planning, internal and external program coordination, recommendations for funding, and coordination of science input for the development of initiatives. The Science Council is responsible for coordinating long-term scientific program and technical support planning including human and physical resources within the Bureau and with external counterparts. The Council addresses crosscutting issues which relate to all areas of program planning, development, and coordination within the Bureau. The Council provides program evaluation.

The **Operations Council** is responsible for coordinating day-to-day program implementation, personnel management, financial management and accountability, equipment and facilities management, information technology management, and communication within the Bureau and with external counterparts. The Council addresses crosscutting issues which relate to all areas of day-to-day program operations within the Bureau, and develops policies, approaches, and/or solutions, as appropriate to improve the conduct of USGS program operations, including development and implementation of common business practices.

B. Organization

For fiscal year (FY) 1997, Congress has directed that the biological science capabilities of the National Biological Service (NBS) be permanently consolidated with the USGS and further directed the transfer to the USGS, during FY 1996, minerals information activities formerly conducted by the U.S. Bureau of Mines. In addition, during FY 1995 through FY 1997, USGS continued to downsize through participation in the voluntary separation incentive payment program. The USGS initiated, near the end of FY 1995, reduction-in-force proceedings in one of the three program divisions, resulting in hundreds of employee separations, reassignments, and changes in positions to lower grades.

The “new” USGS is organized into four major program Divisions -- National Mapping, Geologic, Biological Resources, and Water Resources -- assisted by an Office of Program Support. The more than 10,000 employees of the USGS include research scientists, applied scientists and many specialists and engineers devoted to the mapping, study, and investigation of earth-science, natural science, and environmental issues. The USGS maintains a nationwide network to make available information about its investigations through scientific journals, reports, circulars, maps, digital media, training, and technical assistance.

C. Major Installations

The USGS has offices in each State and Puerto Rico. Principal locations are: National Headquarters in Reston, Virginia; principal regional offices in Reston, Virginia, the Denver metropolitan area (Lakewood, Golden, Arvada, Boulder), Colorado, and Menlo Park, California; other regional offices in Leetown, West Virginia, and Seattle, Washington; special facilities in St. Petersburg, Florida, Bay St. Louis, Mississippi, Vancouver, Washington, Woods Hole, Massachusetts, Flagstaff, Arizona, Atlanta, Georgia, Sioux Falls, South Dakota, Rolla, Missouri, and Anchorage, Alaska; and Research Centers in La Crosse, Wisconsin, Onalaska, Wisconsin, Leetown, West Virginia, Madison, Wisconsin, Laurel, Maryland, Ann Arbor, Michigan, Fort Collins, Colorado, Columbia, Missouri, Jamestown, North Dakota, Gainesville, Florida, Lafayette, Louisiana, Anchorage, Alaska, Corvallis, Oregon, Seattle, Washington, Hawaii National Park, Hawaii, Dixon, California.

The Cooperative Research program operates 54 Research Units and Study Units, and two special projects in 40 States.

D. Government-wide Leadership

The USGS provides coordination of four government-wide programs under directives issued by the Office of Management and Budget (OMB).

1. National Mapping Program: On October 19, 1990, the Executive Office of the President, OMB revised Circular A-16, "Coordination of Surveying, Mapping, and Related Spatial Data Activities." The goals of the Circular are to develop a national digital geographic information resource, to reduce duplication, to reduce the expense of developing geographic data, and to increase the benefits of using available data and ensuring coordination of Federal agency geographic data activities. A major objective of A-16 is the development of a national spatial data infrastructure with the involvement of Federal, State, and local governments, and the private sector. This national information resource, known as the National Spatial Data Infrastructure, linked by criteria and standards, will enable sharing and efficient transfer of spatial data between producers and users.

Pursuant to a recommendation of the National Performance Review, on April 11, 1994, President Clinton signed Executive Order 12906, Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure. The order directs all Federal agencies to contribute to the development of the NSDI and lays out key activities that Federal agencies must conduct in conjunction with State and local governments, academia, and the private sector to ensure the evolution and growth of the NSDI.

Further discussion is provided in Appendix 1.

2. Geologic Hazards, Resources and Processes: OMB Circular A-16 and the National Geologic Mapping Act of 1992 designate the USGS as the Federal agency responsible for planning, coordinating, and managing the National Geologic Mapping Program. The geologic mapping program, including associated geochemical and geophysical mapping investigations, is carried out by a consortium of geologic mapping partners from Federal and state agencies and from academia.

Further discussion is provided in Appendix 2.

3. Water Resources Investigations: Water-related responsibilities are dispersed throughout the Federal Government requiring communication and collaboration among dozens of organizations to identify opportunities to make the best use of available resources. To ensure coordination of water information programs, on December 10, 1991, OMB published Memorandum M-92-01 designating the Department of the Interior, through the USGS, as the lead agency for the Water Information Coordination Program (WICP). The memorandum made specific reference to the need for Federal partnerships with non-Federal entities and directed the USGS and other participant agencies in the WICP to establish routine communications and more effective working relationships with State and local agencies, with Indian Tribes, and with the private sector. Among the directives to the WICP were requirements to plan, design, and operate a cost-effective national network for water data collection and analysis.

Further discussion is provided in Appendix 3.

4. Biological Resources Research, Inventory and Monitoring: On September 30, 1996, the Secretary of the Interior signed Secretarial Order No. 3202 transferring the National Biological Service to the USGS as its Biological Resources Division (BRD). The mission of the BRD is to work with others to provide the scientific understanding and technologies needed to support the sound management and conservation of our Nation's biological resources. The biological science capabilities from all the bureaus of the Department of the Interior were removed and placed in the National Biological Service before it became a division of the USGS. The role of BRD is to meet the needs of the bureaus of the Department of the Interior for scientific and technological information concerning biological resources. However, other federal agencies, states and even private entities are looking to USGS as the premiere source of biological information. USGS scientists constitute one of the largest pools of researchers and technicians expert in the field of biology in the Nation, therefore, many outside interests look to USGS to produce large amounts of high quality biological information.

Further discussion is provided in Appendix 4.

E. Customers and Partners

The U.S. Geological Survey recognizes that improving customer service is a key component of “good government,” and that our interface with customers reflects the effectiveness of our organization. We are committed to making better customer service a reality by readily sharing our extensive scientific knowledge and resources through a variety of customer-oriented services and by expanding these services to meet the needs of new customers. We are also committed to ensuring that the products delivered meet our customers’ expectations. Customer service and satisfaction is being incorporated into our overall strategic planning process as a critical component of our business. Our customer service goals involve not only information dissemination but also fostering partnerships, and integrating customer feedback into the planning and implementation of our programs. The USGS will expand the involvement of customers in programs, through focus groups, technology transfer activities, cooperative ventures, and partnerships. Such customer interaction leverages resources and disseminates Federally-developed products and information, but also ensures that our activities match the expectations and needs of our customers. We need to make sure that not only is existing information delivered effectively, but that the total program of the USGS is directed toward meeting the requirements of our customers, now and in the future.

1. Performance through Customer Service Activities: The USGS has published a Customer Service Plan. The Plan, first issued in August 1994, focuses on improving the access to and delivery of existing USGS information to customers. It presents USGS goals and objectives for customer service as well as our customer service standards. To help refine the Plan, a cross-cutting, bureau-wide team will review current USGS customer service goals, redefine bureau-wide customer service standards, monitor and evaluate progress in meeting goals (this will

include proactively obtaining feedback from customers), and track accomplishments and milestones.

The USGS' short-term customer service goals include:

- delivering products and information to customers promptly and accurately
- streamlining internal processes
- becoming more responsive to customers
- factoring customer feedback into program planning
- making information and products available to customers through a variety of mechanisms and services

Because of the diversity and broad scope of the USGS mission and program activities, customer service goals have been implemented in different ways, depending on the USGS customer and product. Various means of assessing customer service activities are ongoing in every USGS program. For example:

- o The USGS has formed an Information Council to make recommendations concerning corporate policy of the USGS related to information processes, assets, and roles. The USGS Information Council has identified the issue of Information Access as a priority for the USGS. An Information Access Plan has been prepared and will soon be implemented. The Plan outlines goals of identifying necessary actions to make public and internal access to USGS data and information easier and more consistent. The Plan identifies ways to work through existing structures to incorporate information access as a more central part of the way we do business.
- o Thousands of inquiries are handled each week by USGS Earth Science Information Centers (ESICs), located across the country. Each ESIC tracks the number of inquiries received, the types of products distributed, customer profiles, as well as response time and customer complaints. Complaints are resolved immediately. In addition to these activities, the USGS is assembling an Information Service Team to investigate current information and product distribution services in the USGS and determine approaches to reengineer these services to reduce duplication and improve service to customers.
- o To ensure our customers have fast access to the best and most useful science information, products and services, the USGS is developing and using customer-driven information dissemination systems that use innovative tools like the World Wide Web, CD-ROM, and faxback systems. The USGS is moving rapidly to use the World Wide Web for providing real-time and long-term data related to natural hazards such as floods, coastal storms, and droughts. Some of these real-time data sets are already available, for example data from stream gages.

- o Many studies conducted by the USGS are done through partnerships with over 1,100 cooperators including state agencies, municipalities, utilities, and private industry. USGS programs are actively developing new customer feedback mechanisms to help determine priorities, identify issues, and ensure the products of our studies will meet customer expectation.

- o In the National Mapping Program, customer surveys have been completed as part of a marketing effort to identify our customers' needs and the specific products that are most useful to them. The Internet is being used to make products available and to track customer interest.

- o USGS programs determine priorities in consultation with Federal, state and local agencies. For example, revisions to topographic maps are determined by canvassing customers for their needs, and then selecting areas for revision based on the number of agencies expressing interest.

- o Primary external customers are being defined by working groups within USGS programs. These activities are designed to identify key, high impact customers who use our information in decisions made at local, State, and Federal levels and ensuring that we provide these customers with the information that best meets their needs by obtaining customer feedback.

- o Federal, State, and local cooperators provide one half of the funding for the USGS Water Resources Investigations program. The Water Resources program, therefore, works closely with its partners to obtain input and feedback in activity planning and execution.

- o The USGS provides technical assistance to its customers in the application of research and technological results through site visits, workshops and training courses, demonstrations or other personal communications to share "know-how" and expertise as well as technology.

- o Customer service standards set by the Natural Resources Research program give special attention to customer satisfaction and timeliness of response.

2. Performance through Partnerships: The USGS is reimbursed for work performed for other Federal, State, and local agencies whose need for science expertise complements USGS program objectives. Cooperative agreements with more than 1,000 Federal, State, and local agencies and the academic community support a large share of USGS research and investigations. Work for State, county, and municipal agencies is most often conducted on a cost-sharing basis. The USGS works with virtually every Federal government department, including Agriculture, State, the National Science Foundation, Environmental Protection Agency, Federal Emergency

Management Agency, and National Aeronautics and Space Administration, along with the 50 states and Puerto Rico. Professional societies, wildlife and environmental conservation organizations, emergency planning and response agencies, natural history museums, universities, private and corporate land owners and managers, and industrial corporations also constitute major cooperators and partners. A list of selected customers and partners is provided in Appendix 5.

F. Technology Transfer

The USGS encourages collaboration and technology transfer with professionals from industry, government, and academia over a wide range of activities. The USGS has established a Cooperative Research and Development Agreement (CRADA) program under the auspices of the Federal Technology Transfer Act of 1986. Cooperative ventures are being pursued on such subjects as early warning systems for natural disasters, GIS, map-on demand technology, geophysical exploration techniques, remote sensing, and electronic information management. Other CRADAs involve international activities including oil exploration in Kazakhstan and education. USGS vigorously pursues licenses on its patents, encourages staff to seek patents, and manages a formal patent application program.

Various other mechanisms are also utilized to transfer technology and to involve outside professionals in USGS research programs including seminars and forums on topics ranging from energy and minerals to volcano induced aviation hazards. Other vehicles used to help foster this cooperation include memoranda of agreement, an industrial research associate program, and contributed funding authority.

USGS has developed a training program that is periodically offered department-wide to explain how Technology Transfer works and its benefits to the Department of the Interior and USGS. The instructional material is currently being developed as a multi-media CD-ROM to provide greater accessibility to technology transfer training at lower per-student cost.

G. Information Management

The USGS distributes a variety of high quality earth science information in the form of data bases, maps, and scientific and general interest publications. An increasing amount of this information is now available over the Internet and on CD-ROM. Properly managed information can be combined and interpreted for new understandings of earth processes, and has multiple long-term uses across disciplines in government, the private sector, and the general public.

The goal of USGS' information management activities is to consistently organize, catalogue, archive, maintain, and disseminate earth science data and information so that all potential users are aware of and can acquire and apply the information. Specific objectives for the USGS are to:

1. Document and publicize earth science activities and information holdings, and provide online access to this information.
2. Implement USGS data and information policies, standards, and practices that are consistent with Federal information mandates including the Information Technology Management Reform (Clinger-Cohen) Act, OMB Circular A-130, Executive Order 12906 (National Spatial Data Infrastructure), OMB Circular A-16, the various laws governing Technology Transfer, and NARA archival guidelines.
3. Develop partnerships for data collection, data exchange, technology transfer, and standards development.

The USGS is in the process of developing an Information Resource Management Strategic Plan in response to the Information Technology Management Reform (Clinger-Cohen) Act. The plan supports the vision for a national information infrastructure and the vision of the Survey as a fully integrated worldwide distributor of scientifically credible, objective, and relevant information to describe and understand the Earth. The plan will also address the requirements of Executive Order 12906 to implement the National Spatial Data Infrastructure to enhance the access and use of geospatial data as an information resource for the Nation.

H. Human Resources

The U.S. Geological Survey is committed to managing human resources in a manner that results in steady improvement of USGS workforce diversity and the retention of skilled employees. We believe that Human Resources planning and management are central to the achievement of the Core Competencies discussed in Part 2 of this plan.

The USGS has established a Human Resources Council composed of six senior level managers, the Bureau Personnel Officer, and the Bureau Equal Opportunity Officer to identify bureauwide human resource concerns, and propose strategies to address them. Staff development, training, and diversity are among the highest priority concerns of that council.

As the clientele served by the Survey continues to grow more diverse culturally, economically and socially, the USGS must be sensitive to that diversity. In addition to traditional customers and constituents, USGS must reach out to these new customers and stakeholders through targeted recruitment and other techniques which inspire mutual trust and confidence.

USGS will retain and enhance its human resources through: training, education, and developmental opportunities; encouraging self-improvement; providing meaningful work; encouraging participation in professional organizations; and, providing opportunities for excelling at all levels.

Specific objectives for the USGS are to:

1. By 2002, achieve levels of diversity that are reflective of the Nation's citizenry; complete assessment of human resource policies and practices to identify and eliminate systemic barriers to workforce diversity.
2. Decrease under-representation within planned and designated occupational series by achieving annual Affirmative Employment Plan goals.
3. Assist supervisors, managers, and employees in selecting/providing appropriate training to enhance skills and upgrade competencies. This would include training to prepare managers and supervisors to work effectively in a diverse organization. By 2000, assure 100% of USGS managers and supervisors have completed appropriate diversity training.
4. USGS policy is zero tolerance at all organizational levels for incidents of workplace violence or use of illegal substances. By 2002, ensure all managers and supervisors have completed 8 hours of formal training on workplace violence and 4 hours of training on the drug free workplace program.
5. Provide supervisory and leadership development to fulfill the anticipated demand for future supervisors and managers. USGS will conduct formal development programs to achieve supervisory and leadership competencies. By 2002, 100% of newly appointed supervisors and managers will establish Individual Development Plans scheduled for completion within 1 year.
6. Revitalization of USGS's work force will be initiated as a continuous life-long process. All career employees will be encouraged to participate in mission-related developmental programs, with assistance provided through tuition, reimbursement, flexible work schedules, etc. By 2002, 100% of work force will have completed a career development plan.

--PART 5--

Program Evaluations (and other documents) that are used in Establishing Goals, and Schedule of Future Evaluations

Prior Evaluations

A Biological Survey for the Nation. National Research Council, Commission on the Formation of the National Biological Survey. 1993. Washington, D.C.

A Review of the USGS National Water Quality Assessment Pilot Program. National Research Council, Committee on U.S. Geological Survey, Water Resources Research, Water Science and Technology Board (WSTB). 1990. Washington, D.C.

Advanced Cartographic Systems Cost Effectiveness Analysis. Shapiro, Carl D., Amos, Larry L., Brunson, Ernest B., Saghy, David L., Zoller, Donald H., 1989 Reston, VA.

Alternatives for Ground Water Cleanup. National Research Council, Committee on U.S. Geological Survey, Water Resources Research, Water Science and Technology Board (WSTB). 1994. Washington, D.C.

Bridge to a Sustainable Future: National Environmental Technology Strategy. Clinton, President William J. and Gore, Vice President Albert Jr., National Science and Technology Council, 1995. Washington, D.C.

Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure (NSDI). Executive Order 12906: Clinton, President William J., 1994. Washington, D.C.

Enabling the Future: Linking Science And Technology To Societal Goals. Carnegie Commission on Science, Technology, and Government. 1992. Washington, D.C.

Final Report of the Panel to Review EOSDIS Plans. National Research Council, Commission on Physical Sciences, Mathematics, and Applications. 1994. Washington, D.C.

From Red Tape to Results: Creating a Government That Works Better & Costs Less: Report of the National Performance Review. Gore, Vice President Al. 1993. Washington, D.C.

Ground Water Models: Scientific and Regulatory Applications. National Research Council, Committee on U.S. Geological Survey, Water Resources Research, Water Science and Technology Board (WSTB). 1990. Washington, D.C.

Ground Water Vulnerability Assessment: Predicting Relative Contamination Potential Under Conditions of Uncertainty. National Research Council, Committee on U.S. Geological Survey, Water Resources Research, Water Science and Technology Board (WSTB). 1993. Washington, D.C.

Hazardous Materials in the Hydrologic Environment: the Role of Research by the U.S. Geological Survey. National Research Council, Committee on U.S. Geological Survey, Water Resources Research, Water Science and Technology Board (WSTB). 1996. Washington, D.C.

Irrigation-induced Water Quality Programs. National Research Council, Committee on U.S. Geological Survey, Water Resources Research, Water Science and Technology Board (WSTB). 1989. Washington, D.C.

Minerals and Society - A Review of the US Geological Survey's Mineral Resource Survey's Program Plan. National Research Council. 1996. Washington, D.C.

National Mapping Program User Evaluation of Selected Current Products, U.S. Geological Survey Open File Report 95-201: Snyder, Gregory I. 1995.

National Water Quality Assessment Program: The Challenge of National Synthesis. National Research Council, Committee on U.S. Geological Survey, Water Resources Research, Water Science and Technology Board (WSTB). 1994. Washington, D.C.

National Water Quality Monitoring and Assessment. National Research Council, Committee on U.S. Geological Survey, Water Resources Research, Water Science and Technology Board (WSTB). 1986. Washington, D.C.

Opportunities in the Hydrologic Sciences. National Research Council, Committee on U.S. Geological Survey, Water Resources Research, Water Science and Technology Board (WSTB). 1991. Washington, D.C.

Photomechanical versus computer-based methods of preparing and disseminating geologic-map information: A comparison of costs and savings. Matti, Jonathan C., Bernknopf, Richard L., Van Driel, J. Nicholas, Ulrich, George E., and Schindler, J. Stephen 1988. Reston, VA.

Preparing for the Twenty-First Century: A Report to the USGS Water Resources Division. National Research Council, Committee on U.S. Geological Survey, Water Resources Research, Water Science and Technology Board (WSTB). 1992. Washington, D.C.

Primary Mapping Economic Analysis. Shapiro, Carl D., Amos, Larry L, et al. 1988. Reston, VA.

Promoting the National Spatial Data Infrastructure Through Partnerships. National Research Council, Commission on Geosciences, Environment and Resources. 1994. Washington, D.C.

Regional Hydrology and the USGS Stream Gaging Network. National Research Council, Committee on U.S. Geological Survey, Water Resources Research, Water Science and Technology Board (WSTB). 1992. Washington, D.C.

Review of the Department of the Interior's National Irrigation Water Quality Program: Planning and Remediation. National Research Council, Committee on U.S. Geological Survey, Water Resources Research, Water Science and Technology Board (WSTB). 1996. Washington, D.C.

Science and Technology Long Range Strategic Planning. Carnegie Commission on Science, Technology, and Government. 1993. Washington, D.C.

Societal Value of Geologic Maps. U.S. Geological Survey Circular 1111: Bernknopf, Richard L., Brookshire, David S., Soller, David R., McKee, Michael J., Sutter, John F., Matti, Jonathan C., and Campbell, Russel H. 1993. Reston, VA.

Solid Earth Sciences and Society. National Research Council, Commission on Geosciences, Environment and Resources. 1993. Washington, D.C.

Technology for a Sustainable Future. Clinton, President William J. and Gore, Vice President Albert Jr., National Science and Technology Council, 1994. Washington, D.C.

Technology for America's Growth, A New Direction to Build Economic Strength. Clinton, President William J. and Gore, Vice President Albert Jr., 1993. Washington, D.C.

The Biological Resources Division's Client Information Needs Identification Report.

The Biological Resources Division's Implementation Plan for the Strategic Science Plan, September 1996.

The Biological Resources Division's Strategic Science Plan, October 1996.

Toward a Coordinated Spatial Data Infrastructure for the Nation. National Research Council, Commission on Geosciences, Environment and Resources. 1993. Washington, D.C.

Future Evaluations

USGS policy regarding evaluations recognizes several types of reviews including:

- Peer review of scientific programs, proposals, projects, and products by qualified scientific and/or technical experts in the relevant disciplines.
- Management review of programs, proposals, projects, products, and customer information by USGS supervisors and managers for a variety of purposes including confirming that the objectives of programs and projects are being met.

The policy provides for both internal and external reviews by USGS and non-USGS scientists, technicians, or specialists who “are not involved in the specific proposal, project, program, or product under review.”

The goal of the review policy is to conduct an independent external peer review of ongoing programs about every five years, combined with more frequent independent internal management reviews.

Discussions are currently underway with the National Research Council to conduct a study of the future role of the US Geological Survey in the 21st Century. USGS is also participating in a review of Federal mapping programs being conducted by the National Academy of Public Administration in response to a directive contained in FY 1996 Appropriations Committee Report 104-173 from the House of Representatives. In addition, several program level evaluations are planned for the next several years: the specific list is currently being developed.

-- **PART 6** --

Next Steps

The USGS has developed a “first year implementation strategy” and is currently in the process of implementing a number of strategic actions that were identified in the June 6, 1996 publication of the USGS Strategic Plan.

Additional steps to be taken include:

- Continuing consultation with the Congress to confirm the direction of the USGS Strategic Plan;
- Additional follow up with stakeholders regarding their reactions to the plan;
- Further development of an implementation plan and performance measures--signposts that evaluate the effectiveness of implementation; and,
- Further implementation of the Government Performance and Results Act to ensure that formulation of annual performance plans is conducted within the programmatic framework provided by the USGS Strategic Plan and that feedback from customers and stakeholders in response to annual performance reporting is integrated into strategic plan revisions.

APPENDICES

Appendix 1: The USGS Governmentwide role in National Mapping, Geography, and Surveys

Since 1885, when an agreement was signed with the State of Massachusetts to produce topographic maps, the USGS has worked with Federal agencies, State and local governments, the private sector, and academia to provide accurate and timely maps and map-related descriptions of the Nation's terrain, water features, transportation networks, political and administrative boundaries, land cover and use, and other geographic features. At a time when the demand for this information has never been greater, no one organization has the resources to meet this need. Working through the Federal Geographic Data Committee (FGDC) and building on current agreements, the USGS is developing a new network of partnerships to produce detailed, current digital geographic and ortho-imagery coverage for the Nation. This initiative builds on the strengths of the partners so that each meets the needs of its own programs while providing benefits to others. Much of the Federally funded data will be developed through the private sector. In addition, the USGS anticipates that at least a quarter of the data will be from State and local governments, utilities, and others in the private sector.

The Office of Management and Budget (OMB) Circular A-16, titled "Coordination of Surveying, Mapping, and Related Spatial Data Activities," established the FGDC and assigned government-wide coordination leadership responsibilities for eleven data categories to Federal departments. The importance of this activity was affirmed on April 11, 1994, when President Clinton signed Executive Order 12906, Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure.

The USGS provides government-wide leadership to ensure coordinated planning and execution of Federal geospatial mapping efforts through its chairmanship of the FGDC Subcommittee on Base Cartographic Data. As part of this process, the Interior Geographic Data Committee (IGDC) established the Base Mapping Working Group in 1993 to coordinate the requirements for and collection of high priority digital geospatial base data among Department of the Interior (DOI) bureaus. The objectives of this working group are to:

- minimize redundancy in the collection and maintenance of high-priority digital geospatial base data;
- expedite the availability of nationally complete, current digital base data; and,
- promote user awareness of data availability.

On an annual basis, the USGS solicits DOI bureaus for their high-priority requirements for digital geospatial data. The IGDC Base Mapping Working Group determines the priority areas for data collection in the upcoming fiscal year. The DOI bureaus are seeing an increase in the number of their requirements for data met through this working group.

In addition, the USGS actively solicits information on mapping requirements and fosters interagency agreements, cooperative agreements, and other partnerships with Federal, State, and local agencies, as well as with public utilities and the private sector. As part of an effort to improve opportunities for cooperation and partnerships, the USGS has four newly established State liaison positions and plans to establish up to ten additional positions in States over the next three to four years.

To address the changing needs of the external customer community for products and services, the USGS actively collects and analyzes marketing information to help supplement the requirements information gaps related to customer needs, to test new product ideas, and to understand the impacts of technology on customer applications. As part of a larger outreach initiative, the USGS has recently established an External Awareness Working Group to provide a forum for analyzing cross-cutting customer awareness issues and for exchanging diverse customer information and ideas.

The USGS increases its effectiveness and efficiency through collaborative efforts with Federal, State, and local agencies and the private sector. By sharing the cost with users, the USGS is able to accelerate its response to all users' needs more efficiently and at lower Federal cost. Federal, State, and local governments are willing to share the cost for products to stretch their funds for acquiring data at a cost lower than would be incurred by a single agency, and at a faster rate. The National Mapping Program has active data production agreements with 26 Federal agencies and over 200 local, regional, and State agencies in its cooperative program, meeting a wide variety of mapping and geospatial data needs of the Nation, and valued in the range of \$12 million to \$15 million for FY 1997. Federal dollars are leveraged with funding from State and local governments and the private sector. Multiple requirements are merged and consolidated so that two- and three-time leveraging of resources is common. Current examples of cooperative agreements for digital geospatial data collection and integration include:

- U.S. Department of Agriculture Farm Services Agency, U.S. Forest Service, and Natural Resources Conservation Service for joint management, funding, and production of digital ortho-imagery;
- Alaska Department of Transportation for acquisition of digital maps for southeastern Alaska, especially transportation, hydrologic, and boundary data for urban areas; and,
- Florida Southwest Water Management District for acquisition of districtwide digital ortho-imagery coverage.

The USGS also participates in cooperative remote sensing and geographic information systems (GIS) demonstration projects and training activities, supported primarily by reimbursable funding from other DOI bureaus and other Federal and State agencies. The purpose of the

cooperative projects and training courses is to share knowledge and technology with geospatial data users of other organizations.

The USGS' innovative partnerships activity supports USGS efforts to pursue new and flexible approaches to meeting Federal, State, and other user demands for map data and to encourage a broad range of non-Federal map data producers to prepare data to multipurpose standards. In this approach, the USGS offers funds and other assistance to obtain digital geospatial data in cooperation with State or local government agencies, utilities, or private firms that prepare accurate digital map data to meet their own mapping requirements. Applicants are invited to submit proposals, which the USGS evaluates for data accuracy and the ability to meet or be convertible to national standards. Current innovative partnerships for FY 1997 include:

- the Ohio State University's Center for Mapping, working with independent contractors, to digitize 177 quadrangle maps in Ohio; and,
- the Texas Department of Information Resources, working with independent contractors, to acquire 4,600 digital orthophoto quadrangles in eastern Texas.

The National Spatial Data Infrastructure (NSDI) Competitive Cooperative Agreements Program was established by the FGDC to help form partnerships with the non-Federal sector that will assist in the evolution of the NSDI. This program provides funding for cooperative agreements to State and local government agencies, institutions of higher education, and private organizations. The goal is to encourage resource-sharing projects through the use of technology, networking, and more efficient interagency coordination. The 1995 program supported the development and implementation of the National Geospatial Data Clearinghouse for finding and accessing geospatial data, the development and promulgation of FGDC-endorsed standards in data collection, and the development of software tools or techniques to aid in the evaluation of geospatial metadata or data through the clearinghouse. The 1996 program was expanded to encompass two more components: framework development and educational outreach. Thirty-one cooperative agreements were issued in 1996, totaling \$1,085,000.

To handle cartographic and geographic information requests promptly, as well as to get assistance in handling the large volume of data to be catalogued, the USGS has augmented its Earth Science Information Center (ESIC) network by enlisting the assistance of State governments through a State EPIC Program. The USGS provides State EPIC offices with initial catalogs, index microfiche, microfilm, CD-ROM's, and updates to these files as required; and the State EPIC offices provide information services to the public, using their own facilities and employees. The USGS currently has 64 State EPIC agreements in 48 States. In addition, the USGS has Federal EPIC agreements with the Library of Congress and the Tennessee Valley Authority. As part of the National Performance Review, the USGS has revamped its map dealer program to a partnership format, wherein the dealers enter a

cooperative agreement with the USGS to sell and distribute USGS products. There are currently more than 1,500 business partners in the map dealer program.

The USGS National Mapping Program is actively seeking to expand its use of Cooperative Research and Development Agreements (CRADAs), which enable Federal agencies to work with the commercial sector in the area of technology transfer. CRADA's have enabled the USGS to work closely with private industry, sharing expertise in new and emerging technologies to the mutual benefit of USGS and its commercial partners. The USGS provides research partners with mapping data, advanced technology, and technical expertise in programming, requirements and specifications for geospatial data collection, revision, archive, and distribution. The USGS currently has CRADAs involving mapping research with Environmental Systems Research Institute (ESRI); Etak, Inc.; and Sprint Corporation; and has completed a CRADA in automated feature extraction from image sources with Unisys Corporation. A CRADA with the 3M Corporation for a print-on-demand system for cartographic data has recently been negotiated and signed.

Appendix 2: The USGS Governmentwide role in Geologic Mapping

The National Geologic Mapping Act of 1992 and OMB Circular A-16 designate the USGS as the Federal agency responsible for planning, coordinating, and managing the National Geologic Mapping Program. The importance of this activity was affirmed on April 11, 1994, when President Clinton signed Executive Order 12906, Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure.

The Geologic Mapping Program is carried out by a consortium of geologic mapping partners from Federal and State agencies and from academia.

The Federal Geologic Mapping component of the National Geologic Mapping Program establishes the geologic framework of areas determined to be vital to the economic, social, or scientific welfare of the Nation. Geologic mapping priorities are based on:

- National requirements for geologic map information in areas where mapping is required to solve critical earth-science problems, which involve natural hazards, resources (including groundwater), and environmental issues.
- National requirements for geologic map information in areas where overlapping needs of Federal, State, and local agencies have been identified.

Geologic Mapping Support provides interdisciplinary support for geologic mapping, including:

- Paleontologic investigations that provide information critical to understanding the age and depositional environment of fossil-bearing geologic map units. The information is essential for the management of paleontologic resources by agencies such as the BLM, U.S. Forest Service, and National Park Service, as they balance resources and information for citizens as land users and visitors. Results of the investigations are contributed to the National Paleontologic Data Base.
- Geochronologic and isotopic investigations that (a) provide isotopic ages for geologic map units and (b) fingerprint the history of temperature and pressure changes of the rock, and the history of alteration of geologic map units under different conditions in the Earth's crust. Results of the investigations are contributed to the National Geochronologic Data Base.
- Geophysical investigations that assist in delineating and mapping the physical characteristics and three-dimensional distribution of geologic materials and geologic structures. The geophysical map information is contributed to the National Geophysical Map Data Base.

- Geochemical investigations and chemical analyses that characterize the major, minor, and trace elements present in geologic-map units and ground water that lead to the recognition of stable and anomalous assemblages of chemical elements in geologic terrains. The chemical data become part of the National Geochemical Map Data Base.
- Investigations directed toward the implementation of digital geologic mapping techniques, applications of digital geologic-map data to problems and issues of societal importance, and database design, development, and management.

State Geologic Mapping provides for geologic mapping by State geological surveys in order to establish the geologic framework of areas vital to the economic, social, or scientific welfare of individual States. Geologic mapping priorities are determined by State panels and are integrated with national priorities. Federal funding for State Geologic Mapping must be matched on a one-to-one basis with non-Federal funds by each participating State. Geologic maps prepared by the States become part of the National Geologic Map Data Base.

Geologic Mapping Education: Geologic Mapping Education fosters the development of academic programs that teach earth science students the fundamental principles of geologic mapping and field analysis, and provides for broad education in geologic mapping and field analysis through matching funds support of graduate-level investigations.

The USGS coordinates with, and provides geologic and associated information for, a large number of local, State, and Federal agencies and others on a broad array of geologic and coastal and marine studies. For example, the USGS provides basic geologic and interpretative information to Federal land management agencies, including the Bureau of Land Management, U.S. Forest Service, National Park Service, U.S. Fish & Wildlife Service, Bureau of Indian Affairs and others, often with information specifically tailored to their issues. On environmental issues, the USGS coordinates with the U.S. Environmental Protection Agency, the Department of Energy, the Department of Defense, State and local, environmental agencies, and the Department of Justice characterizing sites and providing objective information on the nature, magnitude and source of environmental contamination. In the coastal environment, the USGS cooperates closely with the National Marine Fisheries Service, and the National Marine Sanctuaries and Reserves Division of the National Oceanographic and Atmospheric Administration by providing the marine and coastal geologic information necessary for developing management plans. Locally the USGS coordinates with State geological surveys and other State agencies, communities, and universities. The objectives of the close cooperation and coordination are to:

- assure that the States and local communities are apprised of USGS programmatic activities in the State,
- assure that the USGS is addressing priority issues of local concern and that the information is prepared and presented in a form that is readily usable, and,

- assure that the appropriate mix of scientific expertise, including personnel from State and local agencies and universities as necessary, is addressing identified problems.

Appendix 3: **The USGS Governmentwide role in Water Resources Investigations**

The Federal-State Cooperative program is a major part of the Geological Survey's program of water resources investigations. In many areas of the country, the Cooperative program provides the only source of support for water data collection and investigations required to assess the status of the Nation's water resources. USGS and more than 1,100 cooperating State and local agencies work together in a continuing process that leads to adjustments in each year's program to address emerging national water issues. Water resources concerns and issues requiring attention are determined through discussions with State and local cooperators, with Federal agency officials, by guidance from the Department of the Interior, the Administration, and the Congress, and through awareness of the concerns of the general public.

The enormity and complexity of appraising the Nation's water resources preclude accomplishing the task by Federal efforts alone. Similarly, State and local officials working independently are not always able to address the larger regional or national aspects of water issues. Cooperative planning of data collection and investigations by local, State, and Federal officials promotes a balanced approach to understanding and resolving water related problems. Information developed in the Cooperative program has relevance to topics such as water supply, water quality, waste disposal, and watershed management and protection. Common analytical methods and techniques are used in data collection and analysis, and therefore the information is also relevant to problems having interstate, regional, national, or international significance. The information furnishes the basis required to carry out interstate and international compacts, Federal law and court decrees, regional and national water resources assessments, and planning activities. Moreover, this information is used by the National Weather Service for flood forecasts and warnings.

Development, utilization, and conservation of the Nation's water resources require an adequate data base. The Cooperative program provides funding support for more than half the Nation's data and information base regarding water quantity and responds in a timely manner to the varying and increasing requirements of agencies at all levels of government that have responsibilities for water resources. The program is developed in response to mutual local, State, and Federal needs, and funds are allocated on the basis of jointly-determined priorities after an in-depth project-by-project review.

More than 30 Federal agencies collect and/or use water information in the conduct of their activities. USGS is the largest collector of water information in the United States. Under the December 10, 1991, OMB memorandum, the Department of the Interior, through the USGS, is assigned lead responsibility for the coordination of water resources information in the Federal Government and with the non-Federal sector. The OMB memorandum provides guidance and sets objectives for the Water Information Coordination Program (WICP), including:

- Evaluate the effectiveness of existing water information programs;
- Conduct a nationwide review and evaluation of water quality monitoring activities; and,
- Prepare an annual report that documents funding and program activities.

To begin addressing these issues, an Intergovernmental Task Force on Monitoring Water Quality was formed in FY 1992. The Environmental Protection Agency (EPA) chairs the group, and USGS serves as Vice Chair and Executive Secretary. Membership includes representatives from State, interstate, and Federal water resource agencies. Pilot studies are used to test and refine recommendations made by the Task Force.

In October, 1996, the Advisory Committee on Water Information was chartered by the Secretary of the Interior, under the authority of Office of Management and Budget Memorandum 92-01, and the Federal Advisory Committee Act. The purpose of the Committee is to represent the interests of water-information users and professionals in advising the Federal government on activities and plans related to Federal water-information programs, and the effectiveness of those programs in meeting the Nation's water-information needs. The USGS provides support to this committee.

Appendix 4: **The USGS Government wide role in Biological Resources Investigations**

The USGS received a new major responsibility in October 1996, when the Secretary of the Interior issued Secretarial Order No. 3202 transferring the National Biological Service (NBS) to The USGS as its Biological Resources Division (BRD). Although the order changed its name from NBS to BRD, its mission transferred unchanged to the USGS. USGS's biological resources mission is:

To work with others to provide the scientific understanding and technologies needed to support the sound management and conservation of our Nation's biological Resources.

The Secretarial Order further specified the primary role of the BRD to be:

To meet the biological science needs of other bureaus within the Department of the Interior, as well as those of the States, other Federal agencies, local governments, tribes and private and nonprofit organizations.

These statements constitute a massive and difficult job. The USGS now has the responsibility for the sciences of living resources as well as those of nonliving resources. Now the USGS is charged with searching out and understanding the unknowns about the plant and animal kingdoms, and the significant dynamic relationships among both the living and nonliving elements of earth's life sustaining systems. This is clearly a task that will take decades or centuries to achieve. In the immediate future, USGS's scientists will focus primarily on meeting the needs of DOI bureaus for information relevant to the conservation and management issues facing the nation today and five to ten years into the future. Obviously the magnitude of the need far exceeds the available resources and requires priority setting. The USGS has in place a Bureau Information Needs (BIN) process that involves its customers and colleagues in identifying the most important, urgent needs for biological information, and ranking them in priority order.

This BIN process has addressed and will continue to address the types of information BRD has traditionally provided to its customer bureaus. Examples of traditional types of work are: waterfowl breeding and production surveys on which the Fish and Wildlife Service and all the States depend each year as the basis for setting hunting seasons and bag limits; the breeding bird survey that provides numbers and indices from which decisions are made to list or delist species and populations as threatened or endangered; short-term studies to solve immediate problems on National Parks, National Wildlife Refuges, Bureau of Land Management lands, and other Federal lands.

One of BRD's initiatives that is highly regarded by many States is its GAP Analysis program. This program involves over 400 collaborating organizations including business, academia, and local and State governments. A digitized spatial database of vegetative types, property

boundaries, locations of wildlife habitats, land use types, cultural features, and other features are prepared and used to produce maps showing the juxtaposition of all the attributes and features relevant to a given situation. States and Federal agencies use the information to plan land uses, resource harvest and management practices, and land development patterns to avoid or minimize negative impacts to biological resources. Over forty States are currently participating.

The USGS has 40 BRD Cooperative Research Units located at cooperating universities in 38 States. These Units involve the cooperation of the State Wildlife Agency, the university and USGS' Division of Biological Resources. Graduate students conduct research on subjects agreed upon by the cooperators. The results of this targeted research are pragmatic and usually well received by the intended customers. Many States that do not have such units covet them. For some States, the Cooperative Research Unit is the only biological research capability they have.

However BRD is also beginning to look farther ahead, at a larger array of natural phenomena and systems, and at the effects of man's activities on living systems. This viewpoint expands the scope of research to consider the whole ecosystem rather than the traditional focus on one species or only part of a biological community. The intent is to develop the ability to anticipate negative environmental consequences early enough to prevent them. Already BRD, with the cooperation of its partners, has launched 12 projects addressing ecosystems. Some examples follow:

- ◆ Outer Continental Shelf Environmental studies (Done in cooperation with Minerals Management Service and a number of states.
- ◆ Coral Reefs (Florida, the Caribbean, and Hawaii)
- ◆ Coastal Wetlands
- ◆ Desert and Arid Lands (Dry grazing lands, predominantly in the west)
- ◆ Bottomland Hardwood Forests (In the deltas and flood plains of rivers from New England to Texas)
- ◆ Range and Grasslands (shortgrass steppe, mixed and tallgrass prairie grazing land throughout the west)
- ◆ Prairie Wetlands (throughout the great plains, but concentrated in the prairie pothole region)
- ◆ Large Rivers (Big rivers of interstate and regional concern)
- ◆ Northwest Old Growth Forests (Including the area of the President's Northwest Forest Plan)
- ◆ The Great Lakes and surrounding wetlands.
- ◆ Lower Missouri River

A number of species are of interest nationally because they are approaching threatened or endangered status. Since 1994, BRD has annually funded a series of studies under the heading of Species at Risk in an effort to forestall further endangerment. There are presently 14 of these

projects. Many states and other federal agencies with responsibilities to protect and restore endangered species are interested in the information.

The USGS has initiated an aggressive effort to partner with States on biological studies in which the points of concern reach beyond Federal Laws into State's authorities. Eight such projects are underway in 1997. The USGS has entered into Cooperative agreements with the subject States to collaborate on a mutually desired product.

An exciting area, made possible by developing and expanding computer technology, is USGS's National Biological Information Infrastructure (NBII). It is the twin of USGS's National Spatial Data Infrastructure (NSDI), and provides the leadership to allow many scientific organizations to collaborate in the building of a world wide network of scientific information that may be accessed quickly and efficiently via the World Wide Web and associated networks, and powerful search engines. USGS's two information infrastructures, NSDI and NBII, will together focus the power of knowledge upon the Nation's most intractable problems and challenges. This federation of information sources will be made more accessible and malleable by establishing standards and protocols for data and metadata. Diverse computer platforms and formats will be able to link to the system, and anyone with electronic data that meets the standards and protocols will be able to participate in NBII.

Appendix 5: USGS Customers and Partners

Cooperating office of the U.S. Geological Survey:

b-Biological Resources Division

g-Geologic Division

n-National Mapping Division

w-Water Resources Division

Federal agencies:

Department of Agriculture (b)
Agricultural Research Service (n,w)
Farm Services Administration (n)
Forest Service (b,g,n,w)
National Finance Center (w)
Natural Agricultural Statistical Service (n)
Natural Resources Conservation Service (n,w)

Department of Commerce
Bureau of the Census (n)
National Institute of Standards and Technology (g)
National Ocean Service (n)
National Oceanic and Atmospheric Administration (b, g, n, w)
Climate Analysis Center (w)
National Weather Service (w)
Office of Global Programs (w)

Department of Defense
Defense Advanced Research Projects Agency (g, n)
Defense Finance and Accounting Service (b)
Defense Intelligence Agency (g)
National Imagery and Mapping Agency (n)
Defense Nuclear Agency (g)
National Guard Bureau (w)

Department of the Air Force (w)
Aeronautical Systems Command (w)
Air Force Academy (w)
Air Mobility Command (w)
Brooks Air Force Base (w)
Cannon Air Force Base (w)
Dover Air Force Base (w)
Edwards Air Force Base (g)
88th Regional Support Command (w)
Fort Campbell DAO, Inc. (w)
Headquarters, AFTAC/AC (g)
Hill Air Force Base (w)
Holloman Air Force Base (w)
Langley Air Force Base (w)
Little Rock Air Force Base (w)
MacDill Air Force Base (w)
McGuire Air Force Base (w)
Patrick Air Force Base (g)
Peterson Air Force Base (g)
Tyndall Air Force Base (w)
Vandenberg Air Force Base (w)
Whiteman Air Force Base (w)

Wright-Patterson Air Force Base (w)

Department of the Army (b, w, n)
Aberdeen Proving Ground (w, g)
Army Belvoir RDE Center (g)
Army Environmental Center (n,w)
Army Signal Center (w)
Army Soldier Support Center (w)
Army Reserve Command (w)
89th Regional Support Command (w)
Corps of Engineers (b, g, n, w)
Fort Bragg (w)
Fort Bliss Army Base (w)
Fort Carson (w)
Fort Chaffee (w)
Fort Dix (w)
Fort Huachuca (w)
Fort Irwin (w)
Fort Leonard Wood (w)
Fort McCoy (w)
Fort Polk (w)
Letterkenny Army Depot (w)
National Training Center (g)
Ohio Army National Guard (w)
Picatinny Arsenal (w)
Pueblo Depot Activity (w)
Rocky Mountain Arsenal (w)
Space and Strategic Defense Command (g)
Tooele Army Depot (w)
Topographic Engineering Center (w, g)
White Sands Missile Range (w)
90th U.S. Army Reserve Command (w)

Department of the Navy (b)
Naval Facilities Engineering Command
Southern Division (g, w)
Southwestern Division (g, w)
Special Programs Office (w)
Northern Division (g, w)
Pacific Division (g, w)
Chesapeake Division (g, w)
Naval Air Warfare Center - West (g, w)
Naval Research Laboratory (g)
Naval Surface Warfare Center (w)
Naval Weapons Center, China Lake (g)
Naval Weapons Station (w)
Office of Naval Research (g, w)
U.S. Marine Corps (b, w)
U.S. Pacific Fleet CINCPACF (w)

Department of Energy (g, n, w)
Alaska Power Administration (w)
Bonneville Power Administration (w)
Brookhaven National Laboratory (w)
Idaho Falls Operations Office (w)
Los Alamos National Laboratory (w)
Morgantown Energy Technology Center (g)
National Geothermal Program (g)
Nevada Operations Office (w)
Nuclear Regulatory Commission (w)
Oak Ridge Operations Office (g, w)
Rocky Flats Environmental Technology Site (w)
Oakland Operations Office (g)
Pittsburgh Energy Technology Center (g)
Sandia National Laboratories (g, w)
Schenectady Naval Reactors Office (w)
Southwestern Power Administration (w)
Yucca Mountain Project (g, w)

Department of Health and Human Services
Center for Disease Control (w)

Department of Housing and Urban Development (g)

Department of the Interior
Bureau of Indian Affairs (b, g, n, w)
Bureau of Land Management (b, g, n, w)
Bureau of Reclamation (b, g, n, w)
Minerals Management Service (b, n)
National Park Service (b, g, n, w)
Office of Environmental Affairs (w)
Office of Surface Mining (w)
Office of the Secretary (b, w)
U.S. Fish and Wildlife Service (b, n, w)

Department of Justice (w)

Department of State (g,n)
Agency for International Development (g, n)
Foreign and Nonforeign Governments (g)
Government of Saudi Arabia (g)
International Boundary and Water Commission, U.S. and Mexico (w)
International Joint Commission, U.S. and Canada (w)

Department of Transportation
Federal Highway Administration (g, w)
National Pipeline Mapping System (n)

U.S. Coast Guard (w)	Water Management Division (g)	National Center for Environmental Health (g)
Department of Veterans Affairs (w)	Federal Emergency Management Agency (g,w)	National Science Foundation (b,g,n,w)
Environmental Protection Agency (b, g, n, w) Corvallis Environmental Research Laboratory (w)	Federal Energy Regulating Commission Licenses (w)	Nuclear Regulatory Commission Office of Foreign Disaster Assistance
Environment Research Laboratory (g)	National Aeronautics and Space Administration (b,g,n,w)	Tennessee Valley Authority
Federal Water Quality Administration (w)		
Hazardous Waste Management Division (g)		
Region IX, San Francisco (g)	National Aeronautics and Space Administration	US Agency for International Development
Summitville Mining SiteNTerrace Reservoir (g)	- Goddard Space Flight Center (w)	US Coast Guard (b)

Coordinating Committees: The USGS has established a number of bilateral committees in order to better coordinate programs:

Within the Department of the Interior:

Office of Surface Mining/USGS Intra-agency Committee for Program Coordination
Bureau of Land Management/USGS Intra-agency Committee for Program Coordination
Minerals Management Service/USGS Intra-agency Committee for Program Coordination
Bureau of Reclamation/USGS Intra-agency Coordinating Committee
Fish & Wildlife Service/USGS Intra-agency Coordinating Committee
Discussions are under way to form a similar committee with the National Park Service

Defense Mapping Agency/USGS Interagency Committee for Program Coordination
National Oceanic and Atmospheric Administration/USGS Interagency Committee for Program Coordination
Environmental Protection Agency/USGS Interagency Committee for Program Coordination
U.S. Forest Service/USGS Interagency Committee for Program Coordination
Natural Resource Conservation Service/USGS Intra-agency Coordinating Committee for the Exchange of-Data and Program Coordination
NASA/USGS Intra-agency Coordinating Committee

Other Agencies:

Other Customers and Partners:

The District of Columbia

Professional scientific societies

Wildlife and environmental conservation organizations

Emergency planning and response agencies

Natural history museums

Universities

Private and corporate land owners and managers.

Industrial corporations through Cooperative Research and Development Agreements (CRADAs)

International agencies, including the Great Lakes Fishery Commission and International Joint Commission

Foreign countries, including China, Russia, Canada and Mexico, including activities under a bilateral MOU between the Department of the Interior and the Secretariat for Environment, Natural Resources, and Fisheries (Mexico).

Financial Contributors and Other Major Cooperators:

Cooperators listed are those with whom the USGS had a written agreement cosigned by USGS officials and officials of the cooperating agency for financial cooperation in fiscal year 1996. Parent agencies are listed separately from their subdivisions whenever there are separate

cooperative agreements for different projects with a parent agency and with a subdivision of it. Agencies are listed in alphabetical order under the State or territory where they have cooperative agreements with the USGS. Agencies with whom the USGS has research contracts and to whom it supplied research funds are not listed.

ALABAMA

Alabama Department of-
 • Conservation (w)
 • Economic and Community Affairs (w)
 • Emergency Management (w)
 • Environmental Management (w)
 • Transportation - Highway Department
 Bridge Sites (w)
 Hwy Dept No. 6 Rest Areas
 Alabama Surface Mining Commission
 Anniston, City of (w)
 Auburn University (w)
 Baldwin County Commission (w)
 Birmingham, City of, Water Works Board (w)
 Blountsville, Town of (w)
 Butler, County of
 Century, City of, Florida (w)
 Coffee County Commission (w)
 Courtland, Town of (w)
 Dallas County Commission (w)
 Dauphin Island (w)
 Fayette County Commission (w)
 Florida Department of Environmental
 Protection, Office of Water Policy (w)
 Geological Survey of Alabama (w)
 Greenville, City of, Water Works & Sewer
 Bd. (w)
 Hoover, City of (w)
 Huntsville, City of (w)
 Jasper Water Works & Sewer Board (w)
 Jefferson County Commission (w)
 Linden, City of
 Mobile, City of, Waterworks & Sewer Board
 (w) Montgomery, City of, Waterworks &
 Sanitary Sewer Board (w)
 N. Sumter Water Authority
 Parrish, Town of (w)
 Prattville, City of (w)
 Sumter County Commission (w)
 Sylacauga, City of
 Thomasville, City of (w)
 Tuscaloosa, City of (w)
 University of Alabama

ALASKA

Alaska Department of Community and
 Regional Affairs, Division of Energy (w)
 Alaska Department of Environmental
 Conservation (w)
 Alaska Department of Fish and Game (g, w)

Alaska Department of Military and Veterans
 Affairs (g)
 Alaska Department of Natural Resources (g,
 w)
 Division of Mining and Water
 Management (w)
 Division of Oil and Gas (g)
 Division of Geological and Geophysical
 Survey (g)
 Alaska Department of Transportation (n, w)
 Alaska Energy Authority (w)
 Anchorage, Municipality of (w)
 Juneau, City and Borough of (w)
 Kenai Peninsula Borough (w)
 Sitka, City and Borough of (w)
 University of Alaska, Fairbanks (g, w)

AMERICAN SAMOA

Environmental Protection Agency of
 American Samoa (w)
 Power Authority (w)

ARIZONA

Arizona Department of Environmental Quality
 (w)
 Arizona Department of Game and Fish (b)
 Arizona Department of Transportation (g)
 Arizona Department of Water Resources (w)
 Arizona State University (g)
 Central Arizona Water Conservation District
 (w)
 Cochise County Flood Control District (w)
 Flagstaff, City of (w)
 Gila Valley Irrigation District (w)
 Gila Water Commission (w)
 Havasupai Tribe (w)
 Hualapai Indian Tribe (w)
 Hopi Tribe (w)
 Maricopa County Flood Control District (w)
 Metropolitan Domestic Water Improvement
 District (w)
 Metropolitan Water District of Southern
 California (w)
 Navajo Nation (w)
 Payson, Town of (w)
 Petrified Forest Museum Association (g)
 Pima County Board of Supervisors (w)
 Safford, City of, Water, Gas, and Sewer
 Department (w)
 Salt River Valley Water Users Association (w)

Show Low Irrigation Company (w)
 Tohono O'Dham Nation (w)
 Tucson, City of (g, w)
 University of Arizona (g)

• Office of Research & Contract Analysis (w)
 Williams, City of
 Yavapi-Prescott Indian Tribe (w)

ARKANSAS

Arkansas Department of-
 • Parks and Tourism (w)
 • Pollution Control (w)
 Arkansas Game and Fish Commission (w)
 Arkansas Geological Commission (n,w)
 Arkansas Soil and Water Conservation
 Commission (n,w)
 Arkansas State Highway Commission (w)
 Arkansas-Oklahoma: Arkansas River Compact
 Commission (w)
 Fort Smith, City of (w)
 Little Rock Municipal Water Works (w)
 University of Arkansas-
 • at Fayetteville (w)
 • at Little Rock (w)

CALIFORNIA

Alameda County-
 • Flood Control and Water Conservation
 District
 (Hayward) (w)
 • Water District (w)
 Antelope Valley-East Kern Water Agency (w)
 Borrego Water District (w)
 Cabazon Band of Mission Indians
 Calaveras County Water District (w)
 California Department of-
 • Conservation (n)
 • Fish and Game (w)
 • Parks and Recreation (w)
 • Pesticide Regulation (w)
 • Water Resources (w)
 California Water Resources Control Board (w)
 Calleguas Municipal Water District (w)
 Carpinteria County Water District (w)
 Casitas Municipal Water District (w)
 Chino Basin Water Conservation District (w)
 City of Napa Public Works Department (n)
 Coachella Valley Water District (w)
 Contra Costa County Flood Control and Water
 Conservation District (w)
 Contra Costa Water District (w)
 CRWQCB - San Francisco Bay Region (w)
 Desert Water Agency (w)
 East Bay Municipal Utility District (w)
 Eastern Municipal Water District (w)
 Fox Canyon Groundwater Mgmt. Agency
 Georgetown Divide Public Utility District (w)
 Goleta County Water District (w)
 Hetch Hetchy Water and Power (w)

Hoopa Valley Tribe (w)
 Hopland Band of Pomo Indians (w)
 Humboldt Bay Municipal Water District (w)
 Imperial County Department of Public Works (w)
 Imperial Irrigation District (w)
 Irvine Ranch Water District (w)
 Lompoc, City of (w)
 Los Angeles, County of (w)
 Madera Irrigation District (w)
 Marin Municipal Water District (w)
 Mendocino County Water Agency (w)
 Menlo Park, City of (w)
 Metropolitan Water District of Southern California (g)
 Mission Springs Water District (w)
 Mojave Water Agency (g, w)
 Mono, County of (w)
 Montecito Water District (w)
 Monterey County Water Resources Agency (w)
 Monterey Peninsula Water Management District (w)
 Morongo Band of Mission Indians (w)
 Orange County Water District (w)
 Padre Dam Municipal Water District (w)
 Palmdale, City of
 Pechanga Indian Reservation (w)
 Riverside County Flood Control and Water Conservation District (w)
 Sacramento Municipal Utility District (w)
 Sacramento Regional County Sanitation District (w)
 San Benito County Water Control and Flood Control District (w)
 San Bernardino Environmental Public Works Flood Control District (w)
 San Bernardino Valley Municipal Water District (w)
 San Diego Association of Governments (n)
 San Diego County Department of Public Works (w)
 San Francisco Water Department (w)
 San Geronimo Pass Water Agency (w)
 San Juan Basin Authority (w)
 San Luis Obispo County Engineering Department (w)
 San Mateo County Public Works
 Santa Barbara, City of, Department of Public Works (w)
 Santa Barbara County Water Agency (w)
 Santa Clara Valley Water District (w)
 Santa Cruz, City of (w)
 Santa Cruz County Flood Control and Water Conservation District (w)
 Santa Maria Valley Water Conservation District (w)
 Santa Ynez River Water Conservation District (w)
 Scotts Valley Water District (w)
 Sonoma County Permit & Resource Mgmt. Department (w)
 Sonoma County Water Agency (w)

Soquel Creek County Water District (w)
 Stockton, City of (w)
 Sweetwater Authority (w)
 Tia Juana Valley County Water District (w)
 Tulare County Flood Control District (w)
 Turlock Irrigation District (w)
 United Water Conservation District (w)
 University of California- (b)
 • Davis (g, w)
 • Lawrence Livermore National Laboratory (g)
 • Los Alamos National Laboratory (g)
 • Los Angeles (g)
 • Sanata Cruz (g)
 • Stanford University (g)
 Ventura County Public Works Agency (w)
 Water Master--Santa Margarita River Watershed (w)
 Water Replenishment District of Southern California (w)
 Woodbridge Irrigation District (w)
 Yolo County Flood Control and Water Conservation District (w)
 Yuba County Water Agency (w)

COLORADO

Arapahoe County Water and Wastewater Authority (w)
 Arkansas River Compact Administration (w)
 Aurora, City of (w)
 Black Hawk, City of (w)
 Boulder, City of (b,w)
 Boulder, County Health Department (w)
 Breckenridge, Town of (w)
 Centennial Water and Sanitation District (w)
 Center Soil Conservation District (w)
 Cherokee Metropolitan District (w)
 Clear Creek Board of County Commissioners (w)
 Colorado Department of Agriculture (w)
 Colorado Department of Natural Resources
 Div. of Minerals & Geology (w)
 Div. of Parks & Outdoor Recreation (w)
 Div. of Wildlife (n,w)
 Colorado Department of Public Health & Environment (w)
 Colorado Department of Transportation (w)
 Colorado Office of the State Engineer (w)
 Colorado Oil and Gas Conservation Commission (g)
 Colorado River Water Conservation District (w)
 Colorado School of Mines (g)
 Colorado Springs, City of-
 • City Manager (w)
 • Department of Public Utilities (w)
 Colorado State University (b)
 Crested Butte, Town of (w)
 Crested Butte South Metro District (w)
 Delta County Board of Commissioners (w)
 Denver Board of Water Commissioners (w)
 Durango, City of (w)

Eagle County Board of Commissioners (w)
 Eagle River Water & Sanitation District
 Englewood, City of (w)
 Evergreen Metropolitan District (w)
 Fort Collins, City of (w)
 Fountain Valley Authority (w)
 Fraser Sanitation District
 Fremont Sanitation District (w)
 Garfield, County of (w)
 Glendale, City of (w)
 Glenwood Springs, City of (w)
 Greenwood Village, City of (w)
 Gunnison, City of (w)
 Gunnison, County of (w)
 Julesburg, Town of
 Lakewood, City of (w)
 Lamar, City of (w)
 Las Animas, City of (w)
 La Plata County (w)
 Longmont, City of (w)
 Loveland, City of (w)
 Lower Fountain Water-Quality Management Association (w)
 Meeker Sanitation District (w)
 Meeker, Town of (w)
 Mesa, County of (n)
 Metropolitan Wastewater Reclamation District (w)
 Moffat, County of, Commissioners (w)
 Mt. Crested Butte Water/Sanitation District (w)
 New Mexico State Engineer Interstate Stream Commission (w)
 Northern Colorado Water Conservation District (w)
 North West Colorado Council of Governments
 Pueblo Board of Water Works (w)
 Pueblo, City of, Department of Utilities (w)
 Pueblo, County of (w)
 Pueblo West Metropolitan District (w)
 Purgatoire River Water Conservancy District (w)
 Rio Blanco, County of (w)
 Rio Blanco Water Conservancy District (w)
 Rio Grande Water Conservation District (w)
 Rocky Ford, City of (w)
 St. Charles Mesa Water District (w)
 Southeastern Colorado Water Conservancy District (w)
 Southern Ute Indian Tribe (g, w)
 Southwestern Colorado Water Conservation District (w)
 Steamboat Springs, City of (w)
 Summit, County of
 Teller-Park Soil Conservation District (w)
 Trinchera Water Conservation District (w)
 University of Colorado (g)
 Upper Arkansas Council of Governments (w)
 Upper Arkansas River Water Conservation District (w)
 Upper Eagle Regional Water Authority (w)
 Upper Gunnison River (w)

Upper Yampa Water Conservancy District (w)
 Urban Drainage and Flood Control District (w)
 Vail, Town of (w)
 Winter Park & Sanitation District (w)
 Yellow Jacket Water Conservancy District (w)

COMMONWEALTH OF

NORTHERN MARIANA ISLANDS

Commonwealth Utilities Corp., Saipan (w)
 Northern Mariana Islands, Commonwealth of (w) - • Division of Environmental Quality (w)
 • Municipality of Tinian and Aguigar (w)

CONNECTICUT

Connecticut Department of Environmental Protection (g,n,w)
 Connecticut Department of Transportation, Bureau of Hydraulics and Drainage (w)
 Connecticut Institute of Water Resources
 Fairfield, Town of, Conservation Department (w)
 New Britain, City of, Board of Water Commissioners (w)
 South Central Connecticut Regional Water Authority (w)
 Torrington, City of (w)
 Windham, Town of (w)
 Wolcott, Town of (w)

DELAWARE

Geological Survey (n,w)

DISTRICT OF COLUMBIA

Department of-
 • Consumer and Regulatory Affairs (w)
 • Public Works (w)

FLORIDA

Boca Raton, City of, Public Utilities (w)
 Bradenton, City of, Public Works (w)
 Broward, County of (w)
 Cape Coral, City of, Department of Public Service (w)
 Century, City of (w)
 Clearwater, City of (w)
 Cocoa, City of, Utilities and Public Works (w)

Daytona Beach, City of (w)
 Deerfield Beach, City of (w)
 Dunedin, City of, Public Works and Utilities (w)

Florida Department of-
 • Agriculture & Consumer Services (w)
 • Environmental Protection (n,w)
 • Transportation (n,w)

Florida Keys Aqueduct Authority (w)
 Fort Lauderdale, City of, Utilities Department (w)
 Game and Freshwater Fish Commission (w)
 Hallandale, City of, Utilities and Engineering

(w)
 Hillsborough, County of ,
 Stormwater Management Section (w)
 Hollywood, City of, Public Utilities (w)
 Institute of Phosphate Research (w)
 Jacksonville, City of, Department of Public Utilities (w)
 Jacksonville Electric Authority (w)
 Lake, County of (w)
 Lee, County of, Division of Natural Resources Management (w)
 Manatee County (w)-
 • Environmental Action Commission (w)
 • Public Services Department (w)
 Metropolitan Dade County, (b)
 Environmental Resources Management (w)
 Miami-Dade Water and Sewer Authority (w)
 North Port Water Control District (w)
 Northwest Florida Water Management District (w)
 Orange County of (w)
 Orlando, City of (w)
 Peace River/Manasota Regional Water Supply Authority (w)
 Perry, City of (w)
 Pinellas, County of, Department of Public Works and Utilities (w)
 Reedy Creek Improvement District (w)
 Sarasota, City of (w)
 Sarasota, County of (w)
 Seminole, County of, Public Works, Stormwater Department (w)
 South Florida Water Management District (g,n,w)
 South Indian River Water Control (w)
 Southwest Florida Water Management District (n, w)
 St. Johns River Water Management District (g,n,w)
 St. Petersburg, City of, Public Utilities (w)
 Suwannee River Water Management District (w)
 Tallahassee, City of-
 • Electric Department (w)
 Tampa, City of, Water Department (w)
 University of Florida (g)
 Agricultural Research & Ed. Ctr. (w)
 University of S. Florida,
 Dept. of Civil & Environmental Eng. (W)
 Volusia, County of (w)
 Walton, County of (w)
 West Coast Regional Water Supply Authority (w)

FREELY ASSOCIATED STATES

Commonwealth Utilities Corp., Saipan (w)
 Northern Mariana Islands, Commonwealth of--
 Municipality of Tinian and Aquiquan (w)
 Palau, Government of (w)

GEORGIA

Albany Dougherty Planning Commission (w)

Albany Water, Gas, and Light Commission (w)
 Athens-Clarke County, Department of Public Utilities (w)
 Atlanta, City of, Regional Commission
 Office of Public Works (w)
 Attapulugus, City of (w)
 Bibb, County of (w)
 Blairsville, Town of (w)
 Brunswick, City of (w)
 Cherokee County Water and Sewage Authority (w)
 Clayton County Water Authority (w)
 Covington, City of (w)
 De Kalb County Public Works Department (w)
 Douglas, County of, Department of Planning and Zoning (w)
 Georgia Department of Community Affairs (n)
 Georgia Department of Natural Resources-
 Environmental Protection Division (w)
 Geologic Survey (w)
 Water Resources Management Program (w)
 Georgia Department of Transportation (w)-
 at Atlanta (n, w)
 at Forest Park (n, w)
 Gwinnett, County of, Department of Transportation (w)
 Helena, City of (w)
 Henry, County of, Board of Commissioners (n)
 Lawrenceville, City of (w)
 Macon Water Authority (w)
 Monroe Water, Light, and Gas Commission (w)
 Springfield, City of (w)
 St. Johns River Water Municipal Department (w)
 Thomaston, City of (w)
 Thomasville, City of (w)
 Tift County Commission (w)
 Tifton, City of (w)
 University of Georgia Reserch Foundation (w)
 Valdosta, City of (w)

GUAM

Guam, Government of, Environmental Protection Agency (w)
 Power Authority (w)

HAWAII

Hawaii Board of Land & Natural Resources (w)
 Hawaii, County of, Department of Water Supply (w)
 Hawaii Department of Agriculture,
 Agricultural Resource Management Division (w)
 Hawaii Department of Land and Natural Resources (g)- Commission on Water Resources Management (w)
 Hawaii Department of Transportation (w)
 Hawaii Department of Water & Land

Development

Honolulu, City and County of-
 • Board of Water Supply (w)
 • Department of Public Works (w)
 Kauai, County of, Department of Water Supply (w)
 Maui, County of, Department of Water Supply (w)
 National Tropical Botanical Gardens (w)
 Office of Hawaiian Affairs (w)
 University of Hawaii (g)

IDAHO

Boise State University (g)
 Clearwater Soil and Water Conservation District (w)
 Fremont-Madison Irrigation District (w)
 Idaho Department of Health and Welfare, Division of Environmental Quality (w)
 Idaho Department of Transportation (n)
 Idaho Department of Water Resources (w)
 Nez Perce Indian Tribe (w)
 Salmon River Canal Co., Ltd. (w)
 Shoshone, County of (w)
 Southwest Irrigation District (w)
 Water District No. 01 (Idaho Falls) (w)
 Water District No. 31 (Dubois) (w)
 Water District No. 32D (Dubois) (w)

ILLINOIS

Bloomington and Normal Sanitary District (w)
 Campton Township, Board of Trustees (w)
 Campaign, City of (w)
 Charleston, City of (w)
 Cherry Valley, Village of (w)
 Cook County Forest Preserve District (w)
 Danville Sanitary District (w)
 Decatur, City of (w)
 DeKalb, City of, Public Works Department (w)
 DuPage County Forest Preserve, Planning and Development Section (w)
 DuPage County Department of Environmental Conservation (w)
 Gillespie, City of (w)
 Illinois Department of Conservation (w)
 Illinois Department of Natural Resources (n)
 Geological Survey Division (n)
 Office of Water Resources (n,w)
 Illinois Department of Transportation-
 Division of Highways (n,w)
 Illinois Environmental Protection Agency (w)
 Illinois State Geological Survey (n)
 Kane, County of (w)
 Kankakee Soil and Water Conservation District (w)
 Lake County Department of Planning, Zoning and Environmental Quality (w)
 McHenry County Conservation District (w)
 Monticello, City of (w)
 Northeastern Illinois Planning Commission (n)

Oak Brook, Village of (w)
 Springfield, City of (w)
 University of Illinois (w)
 Urbana, City of (w)
 Vermilion, County of (w)
 Winnebago County Department of Public Works (w)

INDIANA

Carmel, Town of, Utilities (w)
 Elkhart, City of (w)
 Indiana Department of Environmental Management (w)
 Indiana Department of Natural Resources-Division of Water (b,n,w)
 Indiana Department of Transportation (w)
 Indianapolis, City of, Department of Public Works (w)
 Montgomery County Health Department (w)
 South Bend Water Works (w)
 St. Joseph, County of, River Drainage Board (w)

IOWA

Ames, City of (w)
 Cedar Rapids, City of, Engineering Department (w)
 Charles, City of (w)
 Clinton, City of (w)
 Coralville, City of (w)
 Davenport, City of (w)
 Des Moines, City of (w)
 Des Moines Water Works (w)
 Fort Dodge, City of (w)
 Institute of Hydraulic Research (w)
 Iowa City, City of (w)
 Iowa Department of Natural Resources
 Geological Survey Bureau(n,w)
 Iowa Department of Transportation (w)
 Iowa State University (w)
 Linn County Health Department (w)
 Marshalltown, City of (w)
 Sioux City, City of (w)
 University of Iowa (w)
 • Hygienic Laboratory (w)
 Waterloo, City of (w)

KANSAS

Arkansas River Compact Administration (w)
 Cameron, City of, Missouri (w)
 Equus Beds Groundwater Management District No. 2 (w)
 Hays, City of (w)
 Hillsdale Lake Region Res. Conservation Council, Inc. (w)
 Johnson, County of, Department of Public Works (w)
 Kansas Geological Survey (n, w)
 Kansas Highway Commission (w)
 Kansas State Board of Agriculture (w)
 Kansas State University Department of Agronomy (w)

Kansas Water Office (w)
 Prairie Bend Potawatomie Tribe (w)
 Riley, County of (w)
 Topeka Public Works (w)
 Wichita, City of (w)

KENTUCKY

Bullitt, County of, Fiscal Court (w)
 Carrollton, City of (w)
 Elizabethtown, City of (w)
 Georgetown, City of (w)
 Glasgow Water Company (w)
 Kentucky Department of Health Services (w)
 Kentucky Department of Natural Resources and Environmental Protection Cabinet (w)
 Kentucky Office of Geographic Information Systems (n)
 Kentucky Regional Planning & Development (w)
 Kentucky River Authority (w)
 Louisville, City of (w)
 Metropolitan Sewer District (w)
 Ohio River Valley WSC (w)
 University of Kentucky, Kentucky Geological Survey (n,w)
 University of Louisville (w)

LOUISIANA

Amite River Basin River Commission (w)
 Bayou D'Arbonne Lake Watershed (w)
 Calcasieu Parish (w)
 Capital-Area Groundwater Commission (w)
 East Baton Rouge Parish (w)
 Louisiana, Department of Environmental Quality (b,w)
 Louisiana, Department of Natural Resources (b, n, w)
 Louisiana, Department of Transportation and Development-
 Bridge Hydraulics (w)
 Office of Public Works (n, w)
 Louisiana Geological Survey (n)
 Louisiana Office of Emergency Preparedness (w)
 LSU - Coastal Ecology Institute (w)
 Sabine River Compact Administration (w)
 St. Tammany Parish (w)
 St. John the Baptist Parish (w)
 Vermillion Dist. Bayou - Lafayette Parish (w)
 West Monroe, City of (w)

MAINE

Greater Portland Council of Governments (w)
 Jay, Town of (w)
 Maine Department of Environmental Protection (w)
 Maine Department of Human Services (w)
 Maine Department of Transportation (w)
 Maine Geological Survey (w)
 Portland Water District (w)
 Saco, Town of (w)
 University of Maine at Orono (w)

Windham, Town of (w)

MARYLAND

Baltimore, City of, Water Quality Management (w)
Baltimore County Dept. of Environmental Protection and Resc. (w)
Calvert County Soil Conservation (w)
Delaware River Basin Commission (w)
Interstate Commission on the Potomac River Basin (w)
Maryland Department of Environment (w)
Maryland Department of Natural Resources (w)
Maryland Department of Transportation (w)
Maryland Geological Survey (n,w)
Maryland State Highway Administration, Office of Bridge Development (w)
Susquehanna River Basin (w)
University of Maryland (g)

MASSACHUSETTS

Cape Cod Commission (w)
Dartmouth, Town of (w)
Dedham-Westwood Water District (w)
Massachusetts Department of Environmental Management- Bureau of Resource Protection (w)
Division of Resource Conservation (w)
Massachusetts Department of Environmental Protection- Office of Watershed Management (w)
Massachusetts Highway Department (w)
Metropolitan District Commission-
• Parks, Engineering and Construction Division (w)
• Watershed Management Division (w)
Woods Hole Oceanographic Institution (g)
University of MA, Boston (w)

MICHIGAN

Ann Arbor, City of (w)
Battle Creek, City of (w)
Bay Mills Indian Community (w)
Big Rapids, City of (w)
Cadillac, City of (w)
Clare, City of (w)
Coldwater, City of (w)
Delta Charter Township (w)
Elsie, Village of, Department of Public Works (w)
Flint, City of (w)
Gerrish Township (w)
Huron-Clinton Metropolitan Authority (w)
Imlay, City of (w)
Kalamazoo, City of, Department of Public Works (w)
Lac Vieux Desert Indian Tribe (w)
Lansing Board of Water and Light, Environmental Services Division (w)
Michigan Department of Agriculture, Pesticide and Plant Management (w)

Michigan Department of Environmental Quality (w) Land & Water Management Division
Surface Water Quality Division
Michigan Department of Natural Resources (w)
Fisheries Division
Wildlife Division
Michigan Department of Transportation (w) Design Division
Materials & Tech.
Monroe County Health Department (w)
Negaunee, City of (w)
Norway, City of (w)
Oakland, County of, Drain Comm. (w)
Otsega, County of, Road Comm. (w)
Portage, City of (w)
Portland, City of (w)
Roscommon County Board of Commissioners (w)
Sault Ste. Marie Indian Tribe (w)
Southeast Michigan Council of Governments (w)
Sturgis, City of (w)
Tri-County Regional Planning Commission (w)
Wayne, County of
• Department of Environment (n)
• Department of Public Works (w)
• Division of Environmental Health (w)

MINNESOTA

Beltrami County SWCD (w)
Boris Forte Lake Superior Band of Chippewa Indians (w)
Blue Earth, County of (w)
East Otter Tail Soil and Water Conservation District (w)
Elm Creek Conservation Management and Planning Commission (w)
Grand Portage Reservation Tribal Council (w)
Land Management Information Center (n)
Lower Sioux Indian Community (w)
Minnesota Department of Natural Resources (g,w)
Minnesota Department of Transportation (w)
Minnesota Pollution Control Agency (w)
Prairie Island Indian Community (w)
Red River Watershed Management Board (w)
Rochester, City of (w)
Shakopee Mdewakanton Sioux Community (w)
University of Minnesota (b,n)
Dept. of Soil, Water, & Climate (w)
Upper Sioux Indian Community (w)

MISSISSIPPI

Harrison, County of (w)
Jackson, City of (w)
Jackson County Board of Supervisors (w)
Mississippi Department of Agriculture and Commerce (w)
Mississippi Department of Health (w)

Mississippi Department of Environmental Quality--
Office of Land and Water Resources (w)
Office of Pollution Control. (w)
Mississippi Department of Marine Resources (b)
Mississippi Department of Transportation (w)
Mississippi Institute of Higher Learning
Automated Resources Information System (n)
Mississippi State University (g)
Plant and Soil Sciences Dept. (w)
Pearl River Basin Development District (w)
Pearl River Valley Water Supply District (w)
Yazoo Miss. Delta Joint Water Mgmt. Dist. (w)

MISSOURI

Columbia, City of, Department of Public Works (w)
Harrison County Soil & Water Cons. Dist. (w)
Independence, City of, Water Department (w)
KS Univ. Dept. of Chemistry (w)
Metropolitan St. Louis Sewer Dist. (n,w)
Missouri Department of Conservation (n,w)
Missouri Department of Natural Resources, Division of Geology and Land Survey (n,w)
Division of Environmental Quality (w)
Division of Parks, Recreation, and History (w)
Missouri Highway and Transportation Commission (w)
Springfield, City of, Engineering Department (w)
University of Missouri (b)

MONTANA

Blackfeet Nation (w)
Bureau of Mines & Geology (n,w)
Cascade Conservation District (w)
Chippewa Creek Tribe of Rocky Boys Reservation (g)
Fort Peck Indian Reservation (w)
Judith Basin Conservation District (w)
Lewis and Clark City-County Health Department (w)
Montana Department of
• Environmental Quality (n)
Montana Department of Fish, Wildlife and Parks (n,w)
Montana Department of Health and Environmental Sciences (w)
Montana Department of Natural Resources and Conservation (w)
Montana Department of State Lands (w)
Montana Department of Transportation (w)
North Powell Conservation District (w)
Northern Cheyenne Tribe (w)
Ravalli County Commissioners (w)
Salish and Kootenai Tribes (w)
Wyoming State Engineer (w)

NEBRASKA

Blue River Compact Administration (w)

Central Platte Natural Resources District (w)
 Lancaster County Board of Commissioners (w)
 Lincoln, City of (w)
 Loup River Public Power District (w)
 Lower Elkhorn Natural Resources District (w)
 Lower Platte North Natural Resources District (w)
 Lower Platte South Natural Resources District (w)
 Lower Republican Natural Resources District (w)
 Middle Republican Natural Resources District (w)
 Nebraska Department of Roads (w)
 Nebraska Department of Environmental Quality (w)
 Nebraska Department of Water Resources (w)
 Nebraska Natural Resources Commission (n,w)
 Nemaha Natural Resources District (w)
 North Platte Natural Resources District (w)
 Papio-Missouri River Natural Resources Dist. (w)
 Tri-Basin Natural Resources Dist. (w)
 Twin Platte Natural Resources District (w)
 University of Nebraska, Conservation and Survey Division (w)
 Upper Big Blue Natural Resources District (w)
 Upper Loup Natural Resources District (w)
 Upper Niobrara-White Natural Resources District (w)
 Upper Republican National Resources District (w)

NEVADA

Carson City Utilities Department (w)
 Carson Water Subconservancy District (w)
 Churchill, County of (w)
 Clark County (b)
 Clark County Regional Flood Control District (w)
 Clark County Sanitation District (w)
 Douglas, County of (w)
 Duck Valley Reservation (w)
 Henderson, City of (w)
 Las Vegas Valley Water District (g,w)
 Nevada Bureau of Mines and Geology (g,n,w)
 Nevada Department of Conservation and Natural Resources-Division of Water Resources (w)
 Nevada Department of Transportation (w)
 Nevada Department of Wildlife (w)
 Pyramid Lake Paiute Tribal Council (w)
 State of Nevada (g)
 Summit Lake Paiute Indian Tribe (w)
 Tahoe Regional Planning Agency (w)
 Walker River Paiute Tribe (w)
 Washoe, County of, Department of Public Works (w)
 Washoe Indian Tribe (w)

NEW HAMPSHIRE

Keene, City of (w)
 New Hampshire Department of Environmental Services (w)
 New Hampshire Department of Office of State Planning (n)
 New Hampshire Department of Transportation (w)
 Rochester, City of (w)
 Seabrook, Town of (w)

NEW JERSEY

Atlantic Highlands, Borough of (w)
 Bergen, County of (w)
 Brick Township Municipal Utility Authority (w)
 Delaware River Basin (w)
 Gloucester County Planning Department (w)
 Medford, Township of (w)
 Mercer County Park Commission (w)
 Morris County Municipal Utility Authority (w)
 New Brunswick, City of (w)
 New Jersey Department of-
 • Environmental Protection (n,w)
 • Transportation (n,w)
 New Jersey Water Supply Authority (w)
 North Jersey District Water Supply Commission (w)
 Passaic Valley Water Commission (w)
 Pennsylvania Department of Environmental Protection, Bureau of Water Supply & Comm. Health (w)
 Pinelands Commission (w)
 Randolph Township (w)
 Raritan Township Municipal Utility Auth. (w)
 Rutgers State University, Department of Radiation and Environment (w)
 Somerset County Board of Chosen Freeholders (w)
 Washington Township Municipal Utility Authority (w)
 West Windsor, Township of (w)

NEW MEXICO

Albuquerque, City of-
 • Public Works Department-
 Hydrology Division (w)
 Water Utility Planning Division (w)
 Waste Water Division (w)
 Albuquerque Metropolitan Arroyo Flood Control Authority (w)
 Bernalillo County (w)
 Canadian River Water Authority (w)
 Costilla Creek Compact Commission (w)
 Elephant Butte Irrigation District (w)
 El Paso, City of, Water Utilities (w)
 El Paso County Water Improvement (w)
 La Cienega Acequia (w)
 Las Cruces, City of (w)
 New Mexico Department of Environment (w)

New Mexico Department of Health (w)
 New Mexico Department of Highways and Transportation (w)
 New Mexico State University, Water Resources Research Institute (w)
 Office of the State Engineer (w)
 Pecos River Compact Commission (w)
 Pueblo de Cochiti (w)
 Pueblo of Isleta (w)
 Raton, City of (w)
 Rio Grande Compact Commission (w)
 Rio San Jose Flood Control District (w)
 Ruidoso, Village of (w)
 Santa Fe, City of (w)
 Santa Rosa, City of (w)
 State Engineer's Office (n)
 Tribal Council of the Pueblo of Nambe (g)
 University of New Mexico (n)

NEW YORK

Amherst, Town of, Engineering Department (w)
 Auburn, City of (w)
 Camillus, Town of (w)
 Chautauqua County Department of Planning and Development (w)
 Clifton Park Water Authority (w)
 Cornell University (w)
 Erie, County of (w)
 Genesee, County of (w)
 Hudson-Black River Regulating District (w)
 Ithaca, City of, Department of Public Works Water & Sewer Division (w)
 Livingston, County of
 Dept. of Health (w)
 Monroe County Department of Health (w)
 Nassau County Department of Public Works Division of Sanitation and Water Supply (w)
 New York City Environmental Protection Administration, Bureau of
 Bureau of Water Supply and Wastewater (w)
 New York State Canal Corp. (w)
 New York State Department of Environmental Conservation, Planning, and Restoration, Bureau of Monitoring and Assessment (n,w)
 New York State Department of Transportation (w)
 New York State Power Authority (w)
 Nyack, Village of, Board of Water Commissioners (w)
 Onondaga, County of-
 • Department of Drainage and Sanitation (w)
 • Soil and Water Conserv. Dept. (w)
 • Water Authority (w)
 Rockland, Town of (w)
 Seneca Nation of Indians (w)
 State University at Syracuse, Department of Environmental Sciences and Forestry (w)
 Steuben County Industrial Develop. Agency (w)

Suffolk, County of-
 • Department of Health Services (w)
 • Water Authority (w)
 Susquehanna River Basin Comm. (w)
 Ulster, County of (w)
 • Health Department (w)
 Victor, Village of (w)

NORTH CAROLINA

Appalachian State University (g)
 Asheville, City of (w)
 Bethel, Town of (w)
 Brevard, City of (w)
 Center for Geographic Information & Analysis (n)
 Chapel Hill, Town of (w)
 Charlotte, City of (w)
 Danville, Virginia, City of (w)
 Durham, City of (w)
 Fayetteville, City of (w)
 Greensboro, City of (w)
 Guilford County SWCD (w)
 Jackson, County Commissioners (w)
 Lexington, City of (w)
 Lumber River Council of Governments (w)
 Mecklenburg, County of (w)
 Morganton, City of (w)
 North Carolina Cooperative Extension Service, Dallas and Raleigh (w)
 North Carolina State Department of Environment, Health, and Natural Resources (n,w)
 North Carolina State Department of Transportation (w)
 Orange County (w)
 Raleigh, City of (w)
 Rocky Mount, City of (w)
 Triangle Area Water Supply Monitoring, Project Steering Committee (w)
 University of North Carolina, Wilmington, (g)

NORTH DAKOTA

Ardmore, City of (w)
 Barnes County Soil Conservation District (w)
 Burleigh County Water Resources Dist. (w)
 Cass County Joint Water Resources District (w)
 Devils Lake Sioux Tribe (w)
 Dickinson, City of (w)
 Lower Heart Water Resources District (w)
 Mercer County Water Resources Dist. (w)
 Minot, City of (w)
 North Dakota Department of Game & Fish (w)
 North Dakota Department of Health (w)
 North Dakota Department of Transportation (n,w)
 North Dakota Geological Survey (n)
 North Dakota Industrial Commission (n)
 Red River Joint Water Management Board (w)
 Red River Watershed Management Board (w)
 Southeast Cass Water Resources (w)
 Spirit Lake Sioux Tribe (w)
 Stark County Water Resources Dist. (w)

State Water Commission (w)
 Three Affiliated Tribes (w)
 Turtle Mountain Tribe (w)

OHIO

Akron, City of (w)
 Canton, City of (w)
 Columbus, City of (w)
 Cortland, City of (w)
 Cuyahoga County Board of Health (w)
 Sanitary Eng. Division (w)
 Cuyahoga River Commission (w)
 Eastgate Development Transportation Agency (w)
 Fremont, City of (w)
 Geauga, County of, Planning Commission (w)
 Lima, City of (w)
 Madison, County Commissioners (w)
 Miami Conservancy District (w)
 Midwest University, Consortium for International Activities (g)
 N.E. Ohio Regional Sewer District (w)
 Ohio Biological Survey (w)
 Ohio Department of Natural Resources (w)
 Ohio Department of Transportation (n,w)
 Ohio State University
 • Center for Mapping (n)
 • Research Foundation (w)
 Ross, County of, Board of Commissioners (w)

Summit County Engineers (w)
 Toledo, City of, and Ohio State University (w)
 Washington, County Commissioners (w)

OKLAHOMA

Ardmore, City of (w)
 Canadian River Municipal Water Authority (w)
 Henryetta, City of (w)
 McGee Creek Authority (w)
 Oklahoma City, City of (w)-
 • Water and Waster Water Utility (w)
 Office of the Secretary of the Environment (w)
 Oklahoma Conservation Commission (w)
 Oklahoma Department of Transportation (n)
 Oklahoma Department of Wildlife Conservation
 Natural Resources Section (w)
 Oklahoma Geological Survey (n)
 Oklahoma State University, Division of Agricultural
 Sciences and Natural Resources (w)
 Oklahoma Water Resources Board (w)
 Scenic River Commission (w)
 Tulsa, City of (w)

OREGON

Albany, City of (w)
 Ashland, City of (w)
 Bend, City of (w)
 Clackamas County (w)
 Coos, County Board of Commissioners (w)

Coos Bay-North Bend Water Board (w)
 Douglas, County of, Natural Resources Division (w)
 Eugene, City of, Water and Electric Board (w)

Grand Ronde ConFed Tribes (w)
 Gresham, City of, Department of Environmental Services (w)
 Jefferson County Commission (w)
 McMinnville, City of (w)
 Oregon Association, Clean Water Agencies (w)
 Oregon Department of Environmental Quality (w)
 Oregon Department of Fish and Wildlife (b)
 Oregon Department of Human Resources, State Health Division (w)
 Oregon Department of Transportation, Highway Division (g, w)
 Oregon Department of Fish and Wildlife (w)
 Oregon Department of Water Resources (w)
 Oregon State University (g)
 Pacific States Municipal Flood Control (w)
 Portland, City of-
 Bureau of
 Environmental Services (w)
 Water Works (w)
 Tillamook County (w)
 Unified Sewerage Agency (w)
 Warm Springs Tribal Council (w)
 West Linn, City of (w)

PENNSYLVANIA

Adams County Board of Commissioners (w)
 Adams County Office of Planning & Dev. (w)
 Allentown, City of, Engineering Department (w)
 Bethlehem, City of (w)
 Bucks, County of (w)
 Chester County Water Resources Authority (w)
 Delaware County Solid Waste Authority (w)
 Delaware Geological Survey (w)
 Delaware DNREC, Division of Soil and Water Conservation (w)
 Delaware River Basin Commission (w)
 Doylestown Township Municipal Authority (w)
 Harmony Water Authority (w)
 Harrisburg, City of, Department of Public Works (w)
 Hazelton City Authority Water Department (w)
 Indiana County Municipal Authority (w)
 Jefferson County (w)
 Letort Regional Authority (w)
 Luzerne County EMA (w)
 New Oxford Municipal Authority (w)
 North Penn Water Authority (w)
 North Wales Water Authority (w)
 Philadelphia, City of, Water Department (w)
 Pennsylvania Department of Environmental

Protection, Bureau of-
 Land and Water Conservation (w)
 Mining and Reclamation (w)
 Water Supply and Community Health (w)
 Topography & Geological Surveys (n)
 Pennsylvania Department of Transportation (w)
 Pennsylvania State University (b)
 Roaring Spring Municipal Authority (w)
 Sunbury, City of, Municipal Authority (w)
 Susquehanna River Basin Commission (w)
 Union County Emergency Management Services (w)
 University Area Joint Authority (w)
 Warwick Township (w)
 Williamsport, City of (w)

PUERTO RICO

Puerto Rico Aqueduct and Sewer Authority (w)
 Puerto Rico Civil Devense (w)
 Puerto Rico Department of Natural and Environmental Resources (w)
 Puerto Rico Electric Power Authority (w)
 Puerto Rico Environmental Quality Board (w)
 Puerto Rico Industrial Development Company (w)

RHODE ISLAND

Narragansett Bay Water Quality Commission (w)
 North Kingstown, Town of (w)
 Providence, City of, Water Supply Board (w)
 Rhode Island State Department of Environmental Management-
 Division of • Water Resources (w)
 • Water Supply (w)
 Rhode Island State Department of Health
 State Water Resources Board (w)

SOUTH CAROLINA

Beaufort-Jasper County Water Authority (w)
 Camden, City of (w)
 Charleston Commission of Public Works (w)
 Clarendon Sumter Soil and Water Conservation District (w)
 Clemson University (w)
 Dillon, City of (w)
 East Carolina University, Department of Biology (w)
 Greer Commission of Public Works (w)
 Kershaw County Water & Sewer (w)
 Lancaster County Water & Sewer Dist. (w)
 Land Resources Conservation Commission (n)
 Laurens County Water and Sewer Commission (w)
 Mt. Pleasant Waterworks and Sewer Department (w)
 Myrtle Beach, City of (w)
 Oconee County Sewer Commission (w)
 South Carolina State Department of

Health and Environmental Control (w)
 South Carolina State Department of Transportation, Construcion, Engineering and Planning (w)
 South Carolina State Department of Natural Resources, Water Resources Division (n,w)
 South Carolina State Department of Public Service Authority (w)
 Spartanburg County of Environ. Services (w)
 Spartanburg Sanitary Sewer District (w)
 Spartanburg Water System (w)
 University of South Carolina Department of Engineering (w)
 Waccamaw Regional Planning and Development Council (w)
 Western Carolina Regional Sewer Authority (w)

SOUTH DAKOTA

Area II Minnesota River Basin (w)
 Augustana College (n)
 Belle Fourche Irrigation District (w)
 Cheyenne River Sioux Tribe (w)
 East Dakota Water Development District (w)
 Lake Kampeska Water Project District (w)
 Lawrence, County of (n,w)
 North Sioux City, City of (w)
 Ogallala Sioux Tribe, Department of Natural Resources (w)
 Rapid City, City of Public Works Department (w)
 Roberts, County of (w)
 Rosebud Sioux Tribe, Office of Water Resources (w)
 Sioux Falls, City of, Utility Department (w)
 Sisseton-Wahpeton Dakota Nation (w)
 South Dakota Department of Environment and Natural Resources
 Environmental Regulation Division (w)
 Geological Survey Division (w)
 Water Rights Division (w)
 South Dakota Department of Game, Fish and Parks (w)
 Custer State Park Division (w)
 South Dakota Department of Transportation (w)
 South Dakota School of Mines and Technology (n)
 South Dakota State University, Civil Engineering Department (n,w)
 Spearfish, City of (w)
 Vermillion Basin Water Development District (w)
 Watertown, City of (w)
 West River Water Development District (w)
 Wyoming State Engineer (w)

TENNESSEE

Alcoa, City of (w)
 Arlington, City of (w)
 Athens Utility Board (w)

Bedford County (w)
 Blount County Government (w)
 Camden, City of (w)
 Dickson, City of (w)
 Duck River Development Agency (w)
 Eastside Utility District (w)
 Franklin, City of (w)
 Harriman Utility Board (w)
 Harpeth Valley Utility District (w)
 Jackson Utility District (w)
 Lewisburg, City of (w)
 Lincoln, County of (w)
 Medina, Town of (w)
 Memphis, City of, Light, Gas, and Water Division (w)
 Memphis Department of Public Works (w)
 Metropolitan Governments, Nashville, City of, and Davidson, County of (w)
 Murfreesboro, City of, Water and Sewer Department (w)
 Red Boiling Springs, Town of (w)
 Rogersville, Town of (w)
 Savannah Valley Utility District (w)
 Scott's Hill, Town of (w)
 Sevierville, City of (w)
 Shelby, County of (w)
 Springfield, City of (w)
 Tennessee Department of Environment and Conservation, Division of Water Managements (w)
 Tennessee Department of Transportation (w)
 Tennessee Wildlife Resources Agency (w)
 Tullahoma Utilities Board (w)
 University of Tennessee (w)
 Wartrace, Town of (w)

TEXAS

Abilene, City of (w)
 Arlington, City of (w)
 Austin, City of (n, w)
 Bexar-Medina-Atascosa Water District No. 1 (w)
 Brazos River Authority (w)
 Central Texas Council of Governments (w)
 Coastal Water Authority (w)
 Colorado River Municipal Water District (w)
 Corpus Christi, City of (w)
 Dallas, City of (w)
 • Public Works Department (w)
 • Water Utilities Department (w)
 Edwards Aquifer Authority (w)
 El Paso County Water Improvement (w)
 Fort Bend Subsidence District (w)
 Fort Worth, City of (w)
 Gainesville, City of (w)
 Galveston, County of (w)
 Georgetown, City of (w)
 Graham, City of (w)
 Greenbelt Municipal and Industrial Water Authority (w)
 Guadalupe-Blanco River Authority (w)
 Harris, County of (w)

Harris-Galveston Coastal Subsidence District (w)
Houston, City of (w)
Houston-Galveston Area Council (w)
Lavaca-Navidad River Authority (w)
Lower Colorado River Authority (w)
Lower Neches Valley Authority (w)
Lubbock, City of (w)
Nacogdoches, City of (w)
North Central Texas Council of Governments (w)
North East Texas Municipal Water District (w)
North Texas Municipal Water District (w)
Orange, County of (w)
Pecos River Commission (w)
Sabine River Authority of Texas (w)
Sabine River Compact Administration (w)
San Angelo, City of (w)
San Antonio, City of-
• Public Service Board (w)
• Water Systems (w)
San Antonio River Authority (w)
San Jacinto River Authority (w)
Somerville County Water District (w)
Southwest TX State University
Edwards Aquifer Research & Data Center (w)
Tarrant, County of, Water Control and Improvement
District No. 1 (w)
Texas Agricultural Experiment Station (w)
Texas Department of Information Resources (n)
Texas Department of Parks and Wildlife (b)
Texas Natural Resource Conservation Committee (n,w)
Texas Soil and Water Conservation Board (w)
Texas State Department of Transportation (w)
Texas Water Development Board (n,w)
Titus, County of, Fresh Water District (w)
Trinity River Authority (w)
University of Texas, Austin (g)
Bureau of Economic Geology (w)
Upper Guadalupe River Authority (w)
West Central Texas Municipal Water District (w)
Wichita, County of, Water Improvement District No. 2 (w)
Wichita Falls, City of (w)

U.S. VIRGIN ISLANDS

Virgin Islands Department of Planning and Natural Resources (w)

UTAH

Arizona Department of Water Resources (w)
Automated Geographic Reference Center (n)
Bear River Commission (w)
Central Utah Water Conservation District (w)
Goshute Tribal Government (g)
Kanab, City of, Water Department (w)
Kane County Water Conservancy District (w)
Nephi, City of (w)

Ogden River Water Users Association (w)
Park City Public Works (w)
Salt Lake, County of, Flood Control (w)
St. George, City of, Water Reclamation Department (w)
Tooele, City of (w)
Tooele, County of (w)
University of Utah (g)
Utah Department of Environmental Health, Division of Water Quality (w)
Utah Department of Natural Resources (g)-
Geological and Mineral Survey (n)
Oil, Gas, and Mining Division (w)
Water Resources Division (w)
Water Rights Division (w)
Washington County Water Conservation District (w)
Weber Basin Water Conservancy District (w)
Weber River Water Users Association (w)
Utah Div. of Wildlife Resources (w)

VERMONT

Agency of Natural Resources (g)
Agency of Transportation (w)
Engineering Services Division (w)
Department of Environmental Conservation (w)
University of Vermont, Center for Geographic Information (n)

VIRGINIA

Alexandria, City of (w)
Chesterfield, County of (w)
Danville, City of (w)
Hampton Roads Planning Commission (w)
Lord Fairfax Planning Dist. Comm (w)
Newport News, City of (w)
Norfolk, City of (w)
Northern Virginia Planning District Commission (w)
Prince William Public Works (w)
Roanoke, City of (w)
University of Virginia, Department of Environmental Sciences (w)
Virginia Department of Conservation and Reclamation (w)
Virginia Department of Environmental Quality (w)
Virginia Department of Highways and Transportation (w)
Virginia Department of Mines, Minerals, and Energy,
Division of Mineral Resources (n)
Virginia Polytechnic Institute and State University (w)
Washington County Service Authority (w)
West Piedmont Planning District Commission (w)

WASHINGTON

Bellevue, City of (w)
Benton Conservation District (w)

Chelan, County of, Public Utility District No. 1 (w)
Clallam County Department of Community Development (w)
Coeur D'Alene Tribe of Idaho (w)
Douglas, County of, Public Utility District No. 1 (w)
Hoh Indian Tribe (w)
Kent, City of (w)
King County Department of Public Works (w)
Kitsap County Board of Comm. (w)
Lewis County Board of Commissioners (w)
Lower Elwha Tribal Community Council (w)
Makah Indian Tribe (w)
Nisqually Indian Tribe (w)
Pierce, County of, Public Works Department (w)
Port Townsend, City of (w)
Quileute Tribal Council (w)
Quinalt Indian Business Committee (w)
San Juan, County of, Board of Comm.
Dept. of Health & Community Services (w)
Seattle, City of, Light Department (w)
Skagit County Department of Public Works (w)
Snohomish, County of-
• Board of Commissioners (w)
• Public Utilities (w)
Spokane Indian Tribe (w)
Spokane, County of Div. of Utilities (w)
Tacoma, City of, Department of-
• Public Utilities (w)
• Public Works (w)
Tacoma-Pierce County Health (w)
Thurston County Department of Public Works (w)
Umatilla Tribal Council (w)
Washington Department of Fisheries and Wildlife (w)
Washington Department of General Administration (w)
Washington Department of Highways (w)
Washington Department of Information Services (n)
Washington Department of Natural Resources (n)
Washington State Community Development (w)
Whatcom County Planning Department (w)
Yakima Tribal Council (w)

WEST VIRGINIA

New Martinsville, City of (w)
OH River Valley Water Sanitation Comm. (w)
West Virginia Division of-
• Environmental Protection (w)
• Abandoned Mines and Reclamation (w)
• Highways (w)
West Virginia Geological and Economic Survey (g,n,w)

WISCONSIN

Alma/Moon Lake District (w)

Auburn, Town of (w)
 Bad River Tribal Council (w)
 Barron, City of (w)
 Beaver Dam, City of (w)
 Big Hills Lake District (w)
 Brookfield, City of (w)
 Cedar Lake, Town of (w)
 Dane, County of-
 • Department of Public Works (w)
 • Regional Planning Commission (w)
 Delavan, Town of (w)
 Dodge, County of (n)
 Druid Lake Inland Protection and
 Rehabilitation District (w)
 Eagle Spring Lake Management (w)
 Fond Du Lac, City of (w)
 Fontana Walworth Water Pollution Control
 Commission (w)
 Fowler Lake Management District (w)
 Geological and Natural History Survey (w)
 Green Bay Metropolitan Sewerage District (w)
 Green Lake Sanitary District (w)
 Hillsboro, City of (w)
 Kansasville, Town of (w)
 Kirby Lake Management District (w)
 Lac Du Flambeau Indians (w)
 Lauderdale Lakes Lake Management District
 (w)
 Little Arbor Vitae Protection and
 Rehabilitation District (w)
 Little Green Lake Protection and
 Rehabilitation District (w)
 Little St. Germain District District (w)
 Madison, City of (w)
 Madison Metropolitan Sewerage District (w)
 Menominee Indian Tribe of Wisconsin (w)
 Middleton, City of (w)
 Minnesota Pollution Control Agency--

Water Quality Division (w)
 Minnesota Pollution Control Agency, Water
 Quality Division (w)
 Montello Lake Inland Protection and
 Rehabilitation District (w)
 Muskego, City of (w)
 Norway, Town of (w)
 NV Desert Research Institute (w)
 Oconomowoc Lake, Village of (w)
 Okauchee Lake Management District (w)
 Oneida Indian Tribe of Wisconsin (w)
 Peshtigo, City of (w)
 Potters Lake Rehabilitation and Protection
 District (w)
 Powers Lake Management District (w)
 Pretty Lake Management District (w)
 Red Cliff Indians (w)
 River Falls, City of (w)
 Rock, County of, Public Works Department
 (w)
 Sand Lake, Town of (w)
 St. Germain, Town of (w)
 Silver Lake Protection & Rehab. District
 South Florida WMD (w)
 Southeastern Wisconsin Regional Planning
 Commission (w)
 Sparta, City of (w)
 Stockbridge-Munsee Indians (w)
 Summit, Town of (w)
 Thorp, City of (w)
 Twin Lakes Protection and Rehabilitation
 District (w)
 University of Wisconsin (b)
 Walworth County Metro. Sewerage Dist. (w)
 Waterford, Town of (w)
 Waupun, City of (w)
 Whitewater-Rice Lake Management District

(w)
 Wind Lake Management District (w)
 Wisconsin Department of Agriculture, Trade
 & Conservation Protection
 Wisconsin Department of Natural Resources
 (n, w)
 Wisconsin Department of Transportation (w)
 Wittenberg, Village of (w)
 Wolf Lake Management District (w)

WYOMING

Arapahoe/Shoshone Joint Business Council
 (w)
 Cheyenne Board of Public Utilities (w)
 Cheyenne, City of (w)
 Colorado State University (w)
 Evanston, City of (w)
 Fremont County Weed and Pest District (w)
 Lander, City of (w)
 Lincoln, County of (w)
 Lingle - Ft. Laramie Conservation District (w)
 Midvale Irrigation District (w)
 Sar-Encamp-Rawlins Conservation District
 (w)
 Shoshone and Heart Mountain Irrigation
 District (w)
 Star Valley Conservation District (w)
 Teton, County of (w)
 Teton County Natural Resources District (w)
 Water Development Commission (w)
 Wyoming Department of Agriculture (w)
 Wyoming Department of Environmental
 Quality (w)
 Wyoming Department of Transportation (w)
 Wyoming State Engineer (w)

Glossary

Core competencies

Key skills, characteristics, and assets that an organization must possess to excel in its activities.

Devolution

Process whereby functions performed by the Federal government are turned over to States, local governments, or the private sector.

Geographic and cartographic information

Information that has specific geographic coordinates and is displayed in map form.

Geospatial

Refers to the geographic location and characteristics of natural or constructed features and boundaries on the Earth.

Opportunities and threats analysis

An integral part of strategic planning that examines either external conditions that pose an opportunity for further work or conditions that threaten the continuation of existing work.

Partnership

Formal, collaborative working relations with other government, academic, or private industry entities.

Risk assessment

An analysis combining economic, scientific, and socially ethical considerations surrounding a proposed action.

Relationship

Informal agreement involving the exchange of ideas and information with colleagues outside the USGS.

Scenario

Alternative future environment in which decisions made by organizations today might play out. Any scenario is designed to highlight the risks and opportunities associated with specific strategic issues.

Scenario building

Process of developing several plausible views of the future.

Strengths and weaknesses analysis

An internal and external survey of the functional capabilities of an organization.

Workforce

Refers to everyone working for the USGS, including Federal employees, nonpermanent employees, contractors, postdoctoral employees, emeritus employees, and volunteers.

Selected Sources for Information and Publications

USGS Home Page <http://www.usgs.gov>

Technical information and interconnected educational pages explaining the science behind the many programs that encompass the USGS mission.

Earth Science Information Center 1-800-USA-MAPS

Map, book, digital data, and aerial photography products and information.

EARTHFAX 703-648-4888

Menu-driven, 24-hour fax-on-demand service that provides USGS news releases and current information on activities and projects and on a range of water, mapping, biologic, and geologic products.

The USGS welcomes your comments on the Strategic Plan for the U.S. Geological Survey, 1997 to 2005. We expect that the plan will continue to evolve over the next several years as more of the Survey's stakeholders review the plan and offer suggestions and criticisms.

Your thoughts are important to future revisions of this plan. Please forward any comments you would like to make to:

DIRECTOR
US GEOLOGICAL SURVEY
107 NATIONAL CENTER
RESTON, VA 20192